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USSR Report

CHEMISTRY



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ADSORPTION

UDC 541.127:542.921.2:541.183.5:547.235:546.26-162

KINETICS OF THERMAL DECOMPOSITION OF INITIATOR AZO-COMPOUNDS ADSORBED ON DISPERSED CARBONACEOUS SUBSTANCES

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 18 Apr 84) pp 583-588

BRYK, M. T., BURBAN, A. P., GORDEYEV, S. K. and SMIRNOV, Ye. P., Institute
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Kiev; Leningrad Technologic Institute imeni Lensovet

[Abstract] Studies were conducted on the effects of surface properties of powdered diamond, carbon black and graphite on adsorption and thermal decomposition of the polymerization initiators α, α' -azoisobutyric acid (I) and 4,4'-azo-bis-4-cyanovalerianic acid (II). The adsorption of II was significantly greater than adsorption of I, with the contribution of the different surface groups to adsorption ranking as follows: $H < Cl < COOH < NH_2$. The greater adsorptivity of II on all substances (1.5-fold greater on carbon black, 3.4-fold on diamond, 10-fold on graphite) was due to polar COOH groups of II. Degradation studies at 338-353°K showed that the rate constants were ca. 3.5-fold greater for the adsorbed initiators than for I and II in solution. In terms of favoring increasing destruction the support substances ranked as follows: carbon black < diamond < graphite. Analysis of the energies of activation for the destruction of I and II on the carbon supports showed that the surface groups ranked as follows in decreasing the value of this parameter: $H > Cl > COOH > NH_2$. Figures 2; references 27: 22 Russian, 5 Western.
[327-12172]

UDC 543.4:546.799.4

COMBINED GAMMA-ALPHA SPECTROMETRIC DETERMINATION OF PLUTONIUM ISOTOPES

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 25 May 83) pp 365-370

BERDIKOV, V. V. and SUVOROV, M. A.

[Abstract] A combined gamma-alpha spectrometric method has been devised for the rapid and efficient determination of plutonium isotope compositions. The method is based on a comparison of the gamma-energy lines (43.5 and 51.6 keV, 45.2 and 51.6 keV, 148.6 and 129.3 keV) of the analyte and a standard, the isotope composition of which is known with a high degree of accuracy. Once the ratios of Pu-241 to Pu-239 and of Pu-240 to Pu-239 have been determined by gamma-spectrometry, the K values of alpha-spectrometry are used to determine the ratio of Pu-242 to Pu-239. The results obtained by this approach were compared with the results obtained by mass-spectrometry, and found to agree within 0.57 to 1%. The advantages of the combined gamma-alpha spectrometric method over mass spectrometry lie in the saving of time (1-2 h per analysis) and the reliance on less expensive equipment. Figures 1; references 5: 3 Russian, 2 Western.
[328-12172]

UDC 543.7:(546.799.3+546.799.4)

MODERN PHYSICAL METHODS OF NEPTUNIUM AND PLUTONIUM DETERMINATION

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 25 May 83) pp 370-375

BERDIKOV, V. V.

[Abstract] Several spectrometric methods are reviewed as they are applied to the analysis of neptunium and plutonium in the nuclear fuel cycle. The methods considered encompass alpha and gamma spectrometry, noncrystalline x-ray fluorescence, and crystal-base x-ray fluorescence as techniques having considerable advantage over conventional chemical methods due to their unequivocal nature and lack of dependence on valence factors. The latter is

particularly important in assay of neptunium. The high accuracy attainable with these methods is based on the stability of the detectors of alpha, gamma and x-ray emissions, and is only limited by statistical errors inherent in measurements of the analytical lines. The availability of computer-based data processing technology allows the use of very complex programs for management of the analytical information, further improving the accuracy and reliability of the measurements. Finally, a very important advantage of these methods is the preservation of the sample material which can be reanalyzed whenever necessary. Figures 3; references 13: 5 Russian, 8 Western.
[328-12172]

UDC: 551.464.791.7:547.681

DETERMINATION OF BENZ(A)PYRENE IN SURFACE WATERS OF CERTAIN OCEAN REGIONS

Tallinn IZVESTIYA AKADEMII NAUK ESTONSKOY SSR: KHIMIYA in Russian No 2, Apr-May-Jun 85 (manuscript received 5 Apr 84) pp 143-146

URBANOVICH, M., TRAPIDO, Marina and LOBANOV, A., Institute of Chemistry, Estonian SSR Academy of Sciences; Pacific Ocean Oceanographic Institute, Far Eastern Scientific Center, USSR Academy of Sciences

[Abstract] Studies performed aboard the research vessel Akademik Aleksandr Vinogradov in May-July of 1983 determined the content of benz(a)pyrene (BP) in various areas of the ocean. Samples were taken either in a plastic bucket with the ship moving at 4-6 knots or in a Garreth screen with 1 mm² apertures with the vessel stopped at measurement stations. The voyage of the ship included the Baltic Sea, North Sea, English Channel, Atlantic Ocean off Spain, Mediterranean Sea, Suez Canal, Indian Ocean, Pacific Ocean and the Sea of Japan. Due to the low content of the BP in sea water it was extracted from four liter samples with an organic solvent. It is found that the BP concentration in the open areas of the Atlantic and Indian Ocean is at the background level, while elsewhere in the ocean it is close to the background level. A correlation was observed between the content of BP and water and the quantity of suspended matter in the Mekong River delta. BP concentrations range from 0.10 ng/l to 2.47 ng/l. Figures 2; references 7 (Russian).
[301-6508]

UDC 541.454:546.665

LABORATORY STUDIES ON UPTAKE OF Mn-54, Co-57, Nb-95, Zr-95 AND Ce-144 BY
MARINE PLANKTON

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 27 Jun 83; in final form 20 Jun 84) pp 304-308

TIKHOMIROV, V. N.

[Abstract] Controlled laboratory experiments were conducted on the uptake by marine plankton of various radionuclides, to simulate possible radionuclide cycles in nature. The plankton were collected in August from the Indian Ocean at depths of 0-300 m (7°15'6" south latitude, 79°55'9" east longitude). Radioactivity measurements over a 17-day period showed that only Mn-54 and Ce-144 were metabolically assimilated, whereas the other radionuclides were adsorbed to the surface of the plankton without assimilation (Co-57, Nb-95, Zr-95). The mechanism of assimilation in the case of Mn-54 and Ce-144 differed, in that assimilation of Mn-54 did not involve preliminary surface adsorption. In the case of Ce-144 uptake, the initial step consisted of surface adsorption, followed by physiological assimilation. Uptake of the radionuclides by planktonic detritus ranged from ca. 17% for Co-57 to ca. 69% for Ce-144 after 17 days, suggesting that biogenic sedimentation is an important factor in radionuclide accumulation in benthic regions.

References 10: 8 Russian, 8 Western.

[328-12172]

CATALYSIS

UDC 546.214+541.128

DECOMPOSITION OF OZONE ON HOPCALITE

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA: SERIYA 2 KHIMIYA in Russian
Vol 26, No 2, Mar-Apr 85 (manuscript received 16 Dec 83) pp 167-170

POPOVICH, M. P., SMIRNOVA, N. N., SABITOVA, L. V. and FILIPPOV, Yu. V.,
Department of Physical Chemistry [Moscow State University]

[Abstract] Surface heat flow measurement was used to determine the decomposition coefficient of ozone on hopcalite catalyst. A miniature semiconductor thermoresistor covered with the catalyst was employed for data acquisition. Both bead and pressed thermoresistors were used. Despite error of measurement around 30%, the data indicated that the coefficient of decomposition increased with decreasing pressure. This is due to the influence of diffusion on the process. The effective surface area of the hopcalite increased with decreasing pressure as a result of an increased rate of diffusion, leading to an increase in the total decomposition of the ozone. Figures 1; references 15: 9 Russian, 6 Western.
[269-12126]

UDC 541.12.036:546.98

EFFECT OF THERMAL TREATMENT ON CATALYTIC PROPERTIES OF ELECTRODEPOSITED PALLADIUM

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA: SERIYA 2 KHIMIYA in Russian
Vol 26, No 2, Mar-Apr 85 (manuscript received 28 Dec 83) pp 185-187

VOVCHENKO, G. D. (deceased), PLETYUSHKINA, A. I., MASHKOVA, L. P. and STEPINA, N. D., Department of General Chemistry [Moscow State University]

[Abstract] Experimental data relating to the effect of ignition in an oxygen or argon atmosphere on the catalytic properties of electrodeposited palladium are presented. Hydrogenation of maleic acid in a layer of adsorbed hydrogen was used to evaluate catalysis. Galvanostatic and potentiodynamic curves were employed as an indication of hydrogen adsorption. In an argon atmosphere, increased thermal treatment of the catalyst decreased the rate

of electrode potential shift, probably due to the exit of dissolved hydrogen. Ignition in an oxygen atmosphere had little effect on catalytic activity. Heating to 600° slightly increased the rate of electrode potential change. Scanning electron microscopy indicated that heating in argon leads to agglomerative recrystallization, while after heating in oxygen the dendritic structure is retained. Oxides of palladium appear to hinder the ignition process. Figures 1; references 5 (Russian).
[269-12126]

UDC 541.291'26:[547.26+547.5]

NEW METHOD FOR OBTAINING ALCOHOLS VIA CATALYTIC CLEAVAGE OF FORMATES

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 21, No 5, May 85
(manuscript received 26 Jul 84) pp 1129-1130

BOBYLEV, V. A. and DALIN, A. R., State Institute of Applied Chemistry, Leningrad

[Abstract] Formates were found to undergo reduction on a palladium catalyst in hydrogen, leading to the corresponding alcohols. When the alkyl group was primary or secondary, high yields were achieved. This indicates that the method can be recommended for the removal of formyl groups. An aluminum oxide catalyst containing 2% palladium and 3% K₂O was used at a temperature of 220° - 250°C and atmospheric pressure. Reaction products were analyzed by gas liquid chromatography and structures confirmed by PMR and elemental analysis. n-Propanol, n-hexanol, and t-butanol were produced with yields of 95.7%, 92.1% and 55.2% respectively. References 3 (Russian).
[285-12126]

UDC 541.141/145

MOLECULAR PHOTOCATALYTIC PROCESSES. PART 2. OPTIMAL CHARACTERISTICS WITH LIGHT INTENSITIES EQUIVALENT TO 'ONE' OR 'HUNDRED SUNS'

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 11 Jun 84) pp 528-535

VARPOLOMEYEV, S. D., Scientific Research Interfaculty Problem Laboratory imeni A. N. Belozerskiy, Moscow State University imeni M. V. Lomonosov

[Abstract] An analysis was conducted on photocatalytic processes in response to light intensities ranging from the equivalent to one to a hundred suns, using electron transport in photosynthesis as a model system. Proceeding from the Z scheme of photosynthesis requiring two quanta of light for the transport of a single electron, mathematical analysis was conducted for the

design or requirements of an optimal efficiency system. Efficiency of such systems, i.e., rate of product formation (oxygen or biomass), is dependent on light intensity or the concentration of final electron acceptor (CO_2) and can be described by saturation functions. In addition, energy transformation by such molecular systems is a function of absorbed light and the efficiency of transformation is inversely related to light intensity. Mathematical models were derived that showed excellent agreement with experimental data on the efficiency of energy transformation in photosynthetic systems in relation to light intensity absorption area. For photosynthetic systems at 70°C exposed to a 'hundred suns', efficiency could be greatly increased by reducing the size of the pigmented absorbing area 20-fold (ca. 10-20 chlorophyll molecules/active site). Figures 4; references 11: 9 Russian, 2 Western.
[327-12172]

UDC 541.127:546.11.027:547.292

EFFECTS OF CATALYTIC LEVELS OF POLAR ELECTRON DONORS ON KINETICS OF ELECTROPHILIC HYDROGEN ISOTOPE EXCHANGE

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 11 Nov 83) pp 543-547

SEREBRYANSKAYA, A. I., KIRILOVA, A. P. and KURENKOVA, V. M., Scientific Research Physicochemical Institute imeni L. Ya. Karpov, Moscow

[Abstract] An evaluation was made of the effects of different polar electron donors on the kinetics of H-D exchange in 1,4- D_2 -durol in trifluoroacetic acid in relation to the concentration of the donors and their ion-molecular interaction with the acid. In relatively low concentrations (2-3 mole%), the strongest donors (triethylamine, dimethylaniline, hexametapol, dimethyl acetamide) increased the rate constant of the exchange to an essentially identical extent, despite the fact that they differed in basicity by as much as 11 pH_{BH^+} units. The rate constants exceeded ca. 1.5-fold that seen with the acid alone and with the addition of hexane (ca. 2-fold). With the addition of 10-20 mole% donors, the rate constants fell 3- to 4-fold. These anomalous effects were explained on the basis that stable H-complexes were formed between the basic donors and the acid and result in additional stabilization of the transitional phase in solutions with low concentration of the donors. The fact that highly polar (hexametapol, dimethyl acetamide) and weakly polar (triethylamine, dimethylaniline) electron donors exerted an equivalent effect indicates the kinetic complexity of a given reaction in relation to protolytic activity and concentration of electron donors. Figures 1; references 11: 7 Russian, 4 Western.
[327-12172]

EFFECTS OF SULFUR COMPOUNDS ON HYDROGENATION OF UNSATURATED HYDROCARBONS OVER PALLADIUM CATALYSTS

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 9 Oct 84) pp 626-631

BERENBLYUM, A. S., MUND, S. L. and KAREL'SKIY, V. V., Electrogorsk Branch,
All-Union Scientific Research Institute of Petroleum Refining

[Abstract] Studies were conducted on the effects of various sulfur compounds (C_4H_9SH , $C_6H_5CH_2SH$, $(C_6H_5CH_2S)_2$, $(C_8H_{17}S)_2$, $C_4H_9SC_4H_9$, S_8 , $C_2H_5SC_2H_5$) on the hydrogenation of phenylacetylene, 1,3-pentadiene or 1-hexene over Pd catalyst on $\gamma-Al_2O_3$. Studies under conditions covering a temperature range of 20-100°C and 0.1-5.0 MPa pressure in toluene showed that the addition of the S compounds had a profound inhibitory effect on the hydrogenation of the unsaturated hydrocarbons, and was dependent on the nature of the S compounds and directly related to their concentration. With ongoing hydrogenation the initial inhibitory phase was gradually replaced by reactivation of the catalyst. Reactivation was ascribed to the gradual conversion of the poisons into corresponding sulfides (by reaction with the unsaturated hydrocarbons and hydrogen) which did not react with Pd. Under identical experimental conditions PdS on $\gamma-Al_2O_3$ was found not to catalyze hydrogenation of unsaturated hydrocarbons. Figures 4; references 8: 6 Russian, 2 Western.
[327-12172]

FACTORS AFFECTING ACTIVITY OF VARIOUS CHEMICAL CATALYSTS IN OXIDATION OF HYDROGENATION. PART 3. OXIDATION AND ISOTOPE EXCHANGE OF HYDROGEN ON TUNGSTEN CARBIDE

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 28 Dec 83) pp 632-636

IL'CHENKO, N. I., DOLGIKH, L. Yu. and GOLODETS, G. I., Institute of
Physical Chemistry imeni L. V. Pisarzhevskiy, Ukrainian SSR Academy of
Sciences, Kiev

[Abstract] Detailed formulation is presented for the mechanism of hydrogen oxidation at 653°K over tungsten carbide through a wide range of gas mixtures. Depending on the P_{H_2} , the order of the reaction in hydrogen ranges from first to zero, but remains close to first in oxygen. In a 50:50 mixture of H_2 and D_2 oxidation proceeds at a slower rate, reflecting a normal isotopic effect. In excess hydrogen the primary oxidation mechanism involved

interaction of O_2 with reversibly adsorbed H_2 , while at low H_2 concentrations the rate was largely determined by the reaction of H_2 with adsorbed oxygen. The rate of H-D exchange in H_2 - D_2 - O_2 mixtures in low O_2 concentrations was essentially equivalent to the rate of oxidation of H_2 - O_2 mixtures. At 573°K oxidation of hydrogen was first order in hydrogen and zero order in oxygen, both in excess H_2 or excess O_2 . Figures 3; references 6 (Russian). [327-12172]

UDC 541.128.13:542.941.8:546.21:547.732:546.77-31

OXIDATIVE DEHYDROGENATION OF THIOPHANE ON MOLYBDENUM CATALYSTS

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 30 May 84) pp 654-659

MANUYLOVA, L. V., DUDAREV, S. V., TYURIN, Yu. N. and SUKHAREVA, T. S.,
Institute of Catalysis, Siberian Department, USSR Academy of Sciences,
Novosibirsk; Kuzbass Polytechnic Institute, Kemerovo

[Abstract] Experimental studies were conducted to determine the feasibility of using molybdenum oxides as catalysts for oxidative dehydrogenation of thiophane. Studies with MoO_2 , MoO_3 and aluminum-molybdenum and aluminum-molybdenum-potassium catalysts demonstrated that the reaction was readily catalyzed at 300-350°C in air. The transformation of thiophane followed two routes: dehydrogenation into thiophene and formation of SO_2 , CO_2 and H_2O . The use of molybdenum oxides offered definite advantages, in so far as the reaction could be conducted at lower temperatures and in air, and was characterized by a rate constant an order of magnitude higher than commonly seen with molybdenum sulfide catalysts. The latter require higher temperatures (450°C) and an inert gas atmosphere. Figures 4; references 10: 9 Russian, 1 Western. [327-12172]

UDC 541.128.13:541.127:542.91:546.171.1

RATE RELAXATION IN AMMONIA SYNTHESIS

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 28 Jun 84) pp 660-667

SHAPATINA, Ye. N., KUCHAYEV, V. L. and TEMKIN, M. I., Scientific Research
Physicochemical Institute imeni L. Ya. Karpov, Moscow

[Abstract] An analysis was conducted on relaxation phenomena in ammonia synthesis under industrial conditions employing iron catalysts, in particular in reference to slow phenomena at 220-285°C reported in the literature. The basic assumptions regarding relaxation were that various

conditions resulting in an increase or decrease in the rate of ammonia synthesis involve either activation or deactivation, respectively, of the catalyst. Such changes in the catalysts were mathematically analyzed in terms of a turnover time of a catalytic center, the concentration of catalytic centers per unit surface, and the rate constant expressed as the number of molecules formed per unit surface per unit time. Relaxation phenomena, on the basis of such analysis, were shown to be due to alteration in surface characteristics of the iron catalyst by intermediate products. The slow relaxation previously described [Rambo, G., and Amariglio, H., J. Chim-Phys. et Phys-Chim. Biol., 75(1):110, 1978; 75(3):333, 1978; 75(4):397, 1978] was an artifact due to catalyst poisoning with trace concentrations of oxygen or water in the nitrogen-hydrogen mixture. Figures 1; references 11: 8 Russian, 3 Western.
[327-12172]

UDC 541.128.13:542.941:542.952.1:547.21:546.56'92:542.975

CATALYTIC CONVERSION OF SATURATED HYDROCARBONS ON Pt-Cu SYSTEMS

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 7 Aug 84) pp 668-672

VARTANOV, I. A., DZIGVASHVILI, T. R., KHARSON, M. S., MEKHTIYEV, K. M., DOLIDZE, A. V. and KIPERMAN, S. L., Institute of Organic Chemistry imeni N. D. Zelinskiy, USSR Academy of Sciences, Moscow; Institute of Physical and Organic Chemistry imeni P. I. Melikashvili, Georgian SSR Academy of Sciences, Tbilisi

[Abstract] An analysis was conducted on the efficiency of Pt-Cu catalytic systems on Al_2O_3 or aluminosilicate in catalyzing the conversion of n-pentane and n-hexane. Under the conditions employed, a synergistic effect was noted with catalysts containing 1-20 wt% Cu. The reactions observed consisted primarily of isomerization and, in the case of n-hexane, hydrogenolysis and aromatization. However, the latter two conversions proceeded with significantly lower rate constants. The present observations differ from the reports of others that found Cu to diminish the rate of isomerization; the difference in results may be due to the fact that in this study highly dispersed Pt-Cu catalysts were used. In addition, the higher rate constants of isomerization on Al_2O_3 , in comparison to aluminosilicate, were again ascribed to greater dispersion on the former support. The results were most conveniently interpreted in terms of both cluster formation during alloying and electronic interactions (ligand effect). Figures 2; references 13: 4 Russian, 9 Western.
[327-12172]

HYDROGENATION OF 3,7,11,15-TETRAMETHYL-HEXADECENE-1-OL-3-(DEHYDROISOPHYTOL) ON $\text{Ce}/\text{Al}_2\text{O}_3$ OR $\text{Ce-Pd}/\text{Al}_2\text{O}_3$ CATALYSTS UNDER HYDROGEN PRESSURE

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 20 Jul 84) pp 740-742

SOKOL'SKIY, D. V., OMARKULOV, T. O., MUKATAYEV, Zh., ZHUBANOVA, L. K. and BABENKOVA, L. V., Institute of Organic Catalysis and Electrochemistry, Kazakh SSR Academy of Sciences, Alma-Ata

[Abstract] Various factors impacting on the hydrogenation of 3,7,11,15-tetramethyl-hexadecene-1-ol-3-(dehydroisophytol) under hydrogen pressure over $\text{Ce}/\text{Al}_2\text{O}_3$ or $\text{Ce-Pd}/\text{Al}_2\text{O}_3$ catalysts were assessed. Results obtained with continuous system over the temperature range 303-393°K and hydrogen pressures of 0.5-2.02 MPa showed that, with the Ce catalyst, ca. 20% yield in isophytol was attainable under the right temperature and pressure conditions (303°K, 2.02 MPa; or 343°K, 0.50 MPa), without formation of C_{20} saturated alcohol. The maximum yield of isophytol with the Ce-Pd catalysts was 8.0%, with a yield of C_{20} saturated alcohol generally exceeding 80%. Figures 1; references 5 (Russian).
[327-12172]

CHEMOSORPTION OF OXYGEN ON PALLADIUM CATALYSTS

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 18 Jun 84) pp 743-746

KRAVCHUK, L. S., IVASHCHENKO, N. I., TITOVA, L. N. and MOLOD'YANOVA, V. S., Institute of Physicoorganic Chemistry, Belorussian SSR Academy of Sciences, Minsk

[Abstract] Studies were conducted on the effects of Cl^- and NO_3^- on chemisorption of oxygen to $\text{Pd}/\text{Al}_2\text{O}_3$ catalysts prepared from palladium chloride or palladium nitrate, since chemisorption appears to be one of the more effective methods to determine specific surface area of catalysts. Studies were also conducted with catalysts treated at 500°C for 3 h to determine the effects of heat-induced loss of Cl^- and NO_3^- on oxygen chemisorption. The resultant chemisorption data showed that increased O/Pd values were obtained in both cases with the 500°K samples, indicating that Cl^- and NO_3^- have an inhibitory effect on oxygen chemisorption. These observations suggest that more sensitive methods will have to be developed for the determination of specific surface areas that are less susceptible to the effect of admixed ions. References 17: 11 Russian, 6 Western.
[327-12172]

AMMONIA SYNTHESIS OVER Fe-Co CATALYSTS

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 51, No 6, Jun 85
(manuscript received 23 Mar 84) pp 599-603

YATSIMIRSKIY, V. K., ISHCHENKO, Ye. V. and GIRENKOVA, N. I., Kiev State
University imeni T. G. Shevchenko

[Abstract] The efficiency of Fe-Co catalysts prepared by the standard oxidation method and the oxygen-free cyanide approach was studied in ammonia synthesis under atmospheric pressure in a flow-type reactor. Analysis of the isotherms of catalytic activity showed that in both cases maximum efficiency was obtained with catalysts containing 14% Co by weight. Catalytic activity was, therefore, predicated on the chemical composition of the alloys and, thus, the electronic structure of the catalyst. Annealing of high-(14 wt% Co) and low-activity (5 wt% Co) catalysts at 750°C resulted in diminished catalytic activity, particularly in the former sample, and was accompanied by surface changes as evident in scanning electron microscopy. Structural factors were thus demonstrated to be also important in the catalytic activity of the Fe-Co catalysts in this process. Figures 5; references 23: 17 Russian, 6 Western.

[322-12172]

OXIDATION OF HYDROGEN AND CARBON MONOXIDE OVER HIGHLY-DISPERSED TUNGSTEN CARBIDE CATALYST

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 51, No 6, Jun 85
(manuscript received 23 Mar 84) pp 604-606

IL'CHENKO, N. I., SVINTSOVA, L. G., DOLGIKH, L. Yu., KRAVCHUK, L. Yu.,
SHAPOVAL, V. I. and KUSHKHOV, Kh. B., Institute of Physical Chemistry
and Institute of General and Inorganic Chemistry, Ukrainian SSK Academy of
sciences, Kiev

[Abstract] Highly dispersed tungsten carbide (CW) catalyst was prepared by high-temperature electrolysis of tungsten chloride melt under excess CO₂, with samples characterized by a specific surface area of 7.6 m²/g tested for efficiency in promoting oxidation of hydrogen and CO at 573-623°K. In the oxidation of hydrogen the reaction order was 0.5 in hydrogen and -0.9 in oxygen. In the case of CO oxidation to CO₂ the reaction order was 0.9 in oxygen and -0.3 in CO. The fine CW catalyst was assessed as a suitable catalyst for high-temperature oxidation of hydrogen and carbon monoxide. Figures 2; references 11: 10 Russian, 1 Western.

[322-12172]

KINETICS OF 2-BUTANOL OXIDATION OVER Fe-Te-Mo CATALYST

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 51, No 6, Jun 85
(manuscript received 21 Dec 83) pp 606-610

KOZHARSKIY, V. A., ZHIZNEVSKIY, V. M. and MOKRYI, Ye. N., Lvov Polytechnic Institute

[Abstract] Summary data are presented in tabular and graphic form on the oxidation of 2-butanol over Fe-Te-Mo (1:0.85:1) catalyst at 200 and 400°C. The data showed that the rate of methyl ethyl ketone formation depends on the concentration of oxygen and the alcohol, while the rate of butene synthesis is dependent only on 2-butanol concentration, and the rate of divinyl formation is dependent on the concentration of butenes. On the basis of an oxidation-reduction mechanism for the synthesis of methyl ethyl ketone and divinyl the appropriate kinetic equations were derived for these reactions. Additional information provided included rate constants, their temperature dependence and activation energies for the individual reactions. Figures 4; references 8 (Russian).

[322-12172]

UDC 661.002.68:66.074.32

CATALYTIC CLEANING OF NITROGEN OXIDES FROM EXHAUST NITROSYL GASES

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 29 Jan 85) pp 62-66

DADAJHODZHAYEV, A. T., ABDUKADYROV, B. T. and MIRZAYEV, F. M., Tashkent Order of Friendship of Peoples Polytechnic Institute imeni Abu Raykhan Beruni

[Abstract] A pilot, low-temperature cleaning assembly at a dilute nitric acid plant using an Al-Pd-Co-Mn-K oxide catalyst at flow rates of 20,000-30,000 volumes/h gave a 98-99% removal of nitrogen oxides with a concentration of $H_2:(O_2+NO)$ of 1.0:1.2, increasing to 1.65:1.7 at a flow rate of 43,000 volumes/h. Exhaust gases from a nitrosylsulfuric acid plant also contained cyclohexane; a low-percent Al-Pd-Fe-Mn catalyst gave a 68-70% reduction of nitrogen oxides, with about 40% of the cyclohexane remaining unoxidized by either the nitrogen oxides or by free oxygen in the range 533-633°K. Adding hydrogen in a second-stage contact apparatus gave practically complete reduction of the nitrogen oxides. Sulfur dioxide can poison the catalysts, but at temperatures over 713°K this effect was negligible. Empirical equations relating the rate of reduction of NO to the temperature and concentrations of hydrogen, oxygen, cyclohexane and sulfur dioxide are given. Figures 4; references 9 (Russian).

[310-12672]

COAL GASIFICATION

UDC 552.57:543.42

STUDY OF THERMAL DESTRUCTION OF DONETSK COALS IN VACUUM AND CHARACTERISTICS OF STRUCTURE OF SOME PRODUCTS FORMING DURING THIS

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 3, May-Jun 85
(manuscript received 23 Jul 84) pp 17-23

AMARSKIY, Ye. G. and KOSINSKIY, V. A., All-Union Scientific Research Geological Prospecting Institute of Coal Deposits

[Abstract] Comparative study of thermal decomposition processes of coals of different degree of metamorphism (from D to A) in a vacuum and at normal pressure, using methods of thermobarometry and complex thermal analysis and assessment of structural features of isolated tarry substance by infra-red spectrometry, is described and discussed. Infra-red spectrography data indicate an increase of degree of aromaticity of these tarry substances and an increase of the fraction of condensed structures in their composition with an increase of metamorphism of the starting coals. The matrix of the high-boiling, in a vacuum, tarry substances, liberated from the coals, is evidently the most mobile component of the plastic mass and their composition and structure are determined by the degree of metamorphism and caking capacity of the starting coals. Figures 3; references 10 (Russian).
[323-2791]

UDC 662.749

STUDY OF DESTRUCTION OF DONETSK ANTHRACITES BY DERIVATIVE PLOTTING

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 3, May-Jun 85
(manuscript received 30 Jun 83) pp 24-29

GREBENSCHIKOVA, G. V., ROGAYLIN, M. I., KLEPIKOVA, T. V. and IVANOV, V. P., Institute of Mineral Fuels

[Abstract] Results of thermal destruction of highly-metamorphized anthracites used in production of thermographite are presented and discussed. Anthracites from mine seams 16, h₈ and h₁₀ of the Don basin, differing in ash content, elemental composition, sulfur content and volatile substances,

were studied. The basic indicators (initial temperature, rate of destruction, temperature of peaks of individual stages and loss of mass) of thermal destruction of these highly-metamorphized anthracites are determined not only by the ash content of the samples but also by the composition of the ash, the distribution of mineral components in it, the elemental composition and the yield of volatile substances. Destruction of starting anthracites from l_6 and h_{10} seams, which give a high yield of thermographite, goes intensely in the 410-560°C interval. Maximum rate of destruction increases with the increase of ash content of the anthracites. The degree of destruction of anthracites of the h_8 seam in the 500-1000°C interval is much lower and the loss of weight is 1.7 percent. Figures 2; references 7 (Russian). [323-2791]

UDC 553.983:542.943.5

OZONIZATION OF KERAGEN OF ALEKSINATSKIY SHALE

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 3, May-Jun 85
(manuscript received 1 Jun 84) pp 57-60

YEGORKOV, A. N., SOLOVEYCHIK, I. P. and PROSKURYAKOV, V. A., Leningrad Technological Institute imeni Lensovet

[Abstract] Results of ozonization of Aleksinatskiy shale in acetic acid by a method proposed for comparative study of shales of various deposits are described and discussed. A predominantly aliphatic and partially aromatic nature of Aleksinatskiy kerogen, consisting of material of diverse petrographic type was shown. This is confirmed by identification of n-dicarboxylic and n-monocarboxylic acid, lactonic acid and compounds of isoprenoid structure in products of kerogen ozonization. Figures 2; references 15: 8 Russian, 7 Western. [323-2791]

UDC 662.62:53:74

POWER CHARACTERISTICS OF HIGH-SPEED PYROLYSIS OF BROWN COALS

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 3, May-Jun 85
(manuscript received 28 Jul 84) pp 77-79

PECHENEGOV, Yu. Ya., Saratov Polytechnic Institute

[Abstract] Power characteristics of processes of high-speed pyrolysis of brown coals in gaseous media with combined oxygen and free oxygen are studied on the basis of experimental data of a previous study. The overall thermal effect of oxidative pyrolysis of brown coals depends greatly on the amount of oxygen in the air and introduced with the fuel participating in the

process. The decisive factor is the end temperature of heating of the fuel, which affects the qualitative and quantitative composition of the coal. Irsha-Borodino coal and Yerelova coal were used in the study. Study of the relationship of the ratio $\Delta G_T/O_2$ to the amount of oxygen introduced and to the end temperature of the process showed that the percent of reacting fuel increases with the increase of temperature. The $\Delta G_T/O_2$ ratio is practically constant when the temperature of the process is unchanged within the limits of change of O_2 studied. The endothermal effect of destructive processes at temperature below 730°C is greater in an air blast than in vapor but the opposite relationship is seen at $t_v > 730^\circ\text{C}$. Increase of the amount of air fed reduces this boundary value of the temperature. The specific values of thermal effects obtained in this study differ significantly from values obtained for slow heating and the absence of an oxidative gas medium. Figures 3; references 5 (Russian). [323-2791]

UDC 662.75:542.941

DESTRUCTIVE HYDROGENATION OF COAL DURING IONIC HYDROGENATION

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 3, May-Jun 85
(manuscript received 24 Oct 84) pp 85-89

PARNES, Z. N., LIPOVICH, V. G., KALECHIN, I. V., KALINKIN, M. I., KOCHETYGOV, V. D. and KOROBKOV, V. Yu., Institute of Heteroorganic Compounds imeni A. N. Nesmeyanov, USSR Academy of Sciences; High Temperature Institute, USSR Academy of Sciences

[Abstract] Kansk-Achinsk coal from the Irsha-Borodino deposit was used to demonstrate the possibility of obtaining liquid products from coal by ionic hydrogenation. Orthophosphoric acid was used as a protons donor for ionic hydrogenation and Tetralin served as the hydride-ion donor. The process proceeds in the absence of molecular hydrogen under comparatively mild conditions ($250-350^\circ\text{C}$ and $1.0-3.0\text{ MPa}$) and provides high yields of liquid products with insignificant gas formation. At 400°C , the degree of conversion of the coal mass is about the same during ionic hydrogenation and during thermal dissolution. Figures 1; references 10: 5 Russian, 5 Western. [323-2791]

CONCENTRATION OF ELEMENTS IN PRODUCTS OF COMBUSTION OF COALS

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 3, May-Jun 85
(manuscript received 1 Feb 84) pp 117-125

SHEPRT, M. Ya., ZHUYKOV, B. L., ITKIN, Yu. V., ZHURAVLEVA, Ye. L.,
KULKINA, L. P. and VOLODARSKIY, I. Kh., Institute of Mineral Fuels

[Abstract] Study of distribution of rare and dispersed elements in products of combustion of brown coals and mixtures of them with carbonaceous rock was described and discussed. Elements which are volatile in the atomic state or in the form of oxides (Pb, As, Ge, Ga, Zn, Sb, Mo, Hg, Tl, I, Sn) are sublimed and concentrated in dust entrainments or in high-temperature "chemical filters" in the combustion process while elements such as Sr, Ba, Zr, Ti, Rb, La, Ce, U and Fe remain in the slag, for the most part. The chemical filters consisting of CaO and Nb₂O₅ can extract volatile elements from waste gases at high temperature. Search for super-heavy elements with use of combustion of coal or mixtures of coal and rock made it possible to achieve a sensitivity of 10⁻¹⁴g/g even in the 1st stage of concentration. It is advisable to mix rock (with high ash content) containing trace elements, with low ash content coal to obtain a high yield of trace elements. Figures 3; references 15: 12 Russian, 3 Western.
[323-2791]

UDC 541.127:662.76

HYDROGENATION OF CARBON MATERIALS IN PRESENCE OF CATALYSTS BASED ON HYDRIDES OF INTERMETALLIC COMPOUNDS

Moscow KHIMIYA TVERDOGO TOPLIVA in Russian No 3, May-Jun 85
(manuscript received 27 Jul 84) pp 129-134

RYABCHENKO, P. V., CHERNAVSKIY, P. A., TSEYTLIN, I. L. and LUNIN, V. V.,
Moscow State University imeni M. V. Lomonosov

[Abstract] Study of hydrogenation of mechanical mixtures of carbon containing materials (activated charcoal, soot, graphite) with catalysts based on hydrides of intermetallic compounds (ZrNiH_{2.8}, ZrCoH_{2.8}) is described and discussed. Highest activity was noted in a Zr-Ni-H-graphite system with the high rate of hydrogenation being associated with formation of an active surface of reagents during oxidative-reduction processing. The only product of the reaction is methane, the rate of formation of which depends upon the relationship of the quantities and dimensions of catalyst and graphite particles. Figures 4; references 15: 3 Russian, 12 Western.
[323-2791]

COMBUSTION

UDC 543.42:541.141.7

PULSE OPTO-GALVANIC EFFECT IN FLAMES

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA: SERIYA 2 KHIMIYA in Russian
Vol 26, No 2, Mar-Apr 85 (manuscript received 27 Jul 84) pp 221-222

NOVODVORSKIY, O. A., ZOROV, N. B. and KUZYAKOV, YU. YA., Department of
Analytical Chemistry [Moscow State University]

[Abstract] In order to explain the opto-galvanic effects which can be induced in a flame, it is necessary to consider ambipolar diffusion and recombination of charged particles, making the situation extremely complicated. Irradiation of the flame increases the concentration of charged particles, changing the previously established electrical field. The resulting redistribution of charge causes the first maximum observed in the opto-galvanic effect. Ambipolar diffusion and recombination decrease charge concentration with time, while simultaneously the charged particles are leaving the zone of irradiation. The cloud of charge which results, and which is polarized by the external field, moves toward the cathode, causing the second maximum in the galvanic signal. References 11: 5 Russian, 6 Western.
[269-12126]

UDC 678.5:66.095.115:62-762

SELF-EXTINGUISHING SEALANT COMPOSITION

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 36-37

KYAZIMOVA, T. G. and BABAYEV, R. S.

[Abstract] Sealants based on butylene, ethylene, isoprene, polyisobutylene and other rubbers have low adhesive strength and no resistance to heat and fire. A new composition was developed that is based on poly-N-(phenylethyl) acrylamide, antimony trioxide, 1,2,3,4,7,7-hexachlorobicyclo-(2,2,1)-heptene-2-methyl monochloroacetate (pyrenic), a filler (talc) and spindle oil as plasticizer. The components were roll milled in four different compositions and tested for adhesive strength by measuring shear stress to rupture of various mating surfaces (polyethylene, iron sheet, copper foil), and for

fire resistance by GOST 17088. The sealant composition is shown to have good physical-mechanical properties and may be used in many places in the national economy. References 3 (Russian).
[302-12765]

UDC 678.742.2:667.622.32:543.874

EFFECT OF PIGMENTS OF FLAMMABILITY OF HIGH PRESSURE POLYETHYLENE COMPOSITIONS

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 48-50

YEFIMOVICH, L. Ye., FEDEYEV, S. S., SURTAYEV, A. F., BOGDANOVA, B. B.,
SALTANOVA, V. B. and NESMERCHUK, N. S.

[Abstract] Addition of mineral fillers and metal oxides as pigments to polyolefin compositions containing halogen compounds and Sb_2O_3 as antipyrenes increases the flammability of the composition. A study was made of this drop in flame resistance in high pressure polyethylene containing chlorinated paraffin wax (CP) or decabromodiphenyl oxide (DBD) and zinc or titanium oxide as pigments. Addition of TiO_2 to compositions containing CP or DBD had no effect on flammability, but addition of ZnO in the same amount increased the flammability. X-ray diffraction analysis shows that ZnO inhibits formation of $SbCl_3$ in the gas phase, while TiO_2 has no such effect. The drop in flammability of compositions containing ZnO is due to the chemical reactions of the additives with components of the composition. Therefore, in developing such compositions, it is essential to use additives which do not inhibit reactions between components of the antipyrene system and the release of antimony halides to the gas phase which act as synergists. Such selection is possible on the basis of thermodynamic calculations. Figures 2; references 9: 8 Russian, 1 Western.
[302-12765]

UDC 678.746.22.094.91

EFFECT OF ANTIPYRENES ON IMPACT-RESISTANT POLYSTYRENE

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 50-51

BELOVA, Ye. A., UTKINA, O. G., NIKOLAYEV, A. F., NIKITIN, Yu. V.,
POLONSKIY, V. S., BALLOVA, G. D. and SHENKER, M. A.

[Abstract] Addition of decabromodiphenyl oxide and antimony trioxide as synergist to impact-resistant polystyrene during the compounding stage as antipyrenes has a negative effect on the tensile strength and relative elongation of the thermoplastic. This is normally compensated by adding up to 8% divinylstyrene as thermoelastoplastic. In the present work,

study shows that addition of 10% aluminum hydroxide, 12% of a mixture of decabromodiphenyl oxide and antimony trioxide and 8% thermoelastoplastic results in a self-extinguishing composition which has a fire-resistance class of V0 (according to method UL-94) with no loss in physical-mechanical properties. References 5: 1 Russian, 4 Western.
[302-12765]

ION-ELECTRONIC CONDUCTIVITY OF FUSED SODIUM POLYSULFIDES

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 51, No 6, Jun 85
(manuscript received 23 Mar 84) pp 614-616

DUSHEYKO, V. A., ZINCHENKO, V. F., MUSTYATSA, O. N., VELIKANOV, A. A.
(deceased) and PARNIKOV, Ye. B., Kiev Automobile and Roadway Institute

[Abstract] The mechanisms of electrical conductivity of fused sodium polysulfides, using Na_2S_n samples with $n = 2, 3, 4$ or 5 , was tested by a two-electrode contact method employing 1000 Hz AC current. Conductivity was found to involve a complex ion-electronic mechanism for charge transfer, indicating that the sodium polysulfides function as liquid polyfunctional conductors in which the ionic mechanism predominates. Na_2S_4 had the highest energies of activation and was the compound with the highest ionic component and the least electronic contribution to conductivity, as well as the highest melting temperature. Figures 2; references 6:
4 Russian, 2 Western.
[322-12172]

UDC 669.017.782'234'28

STABILITY AND INTERACTION OF INTERMEDIATE PHASES IN PALLADIUM-MOLYBDENUM-SILICON SYSTEM

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA: SERIYA 2 KHIMIYA in Russian
Vol 26, No 2, Mar-Apr 85 (manuscript received 28 Dec 83) pp 187-190

RAYEVSKAYA, M. V., LASHUK, YE. P., KAZAKOVA, YE. F. and SOKOLOVA, I. G.,
Department of General Chemistry [Moscow State University]

[Abstract] A study was conducted of the palladium-molybdenum-silicon ternary intermetallic system. A review of the literature on the corresponding binary systems indicated that Pd_2Si possessed the highest stability and was most likely to interact with the molybdenum silicides. Microstructural, phase X-ray and microdurometric methods were used to study the alloys, which had been subjected to multi-stage annealing. Casts with 0-50% silicon exhibited dendritic segregation. Alloys annealed at 700° formed binary systems, including PdSi . All the molybdenum silicides interacted with Pd_2Si to form narrow biphasic regions at 700° . These regions possessed hexagonal superstructure. The crystal lattice periods of the phases remained constant with palladium composition. The data indicated that intersolubility of the binary phases were absent. The MoSi_2 - Pd_2Si layers appeared to be of the eutectic type. Figures 3; references 12: 5 Russian, 7 Western.
[269-12126]

NITROGEN COMPOUNDS

UDC 547.317.8+547.321+547.539.1+547.79

1,3-DIPOLAR ADDITION OF AROMATIC AZIDES TO FLUORINE-CONTAINING ACETYLENES AND DIACETYLENES

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 21, No 5, May 85
(manuscript received 12 Jul 84) pp 979-983

STEPANOVA, N. P., ORLOVA, N. A., GALISHEV, V. A., TURBANOVA, Ye. S. and PETROV, A. A., Leningrad Technologic Institute imeni Lensovet

[Abstract] The 1,3-dipolar cycloaddition of aromatic azides with perfluoroalkyl or aryl acetylenes and similar diacetylenes led to the formation of 1-aryl-4-perfluoroalkyl or aryl triazoles, as confirmed by IR, F-19 NMR and PMR. Chemical transformation with LiAlH_4 and K_2CO_3 was used to indicate addition orientation. The interaction of trifluoromethylacetylene with p-methoxyphenylazide led to only one triazole, with the trimethylfluoro substituent in the 4-position. Other reactions resulted in mixtures. Trifluoromethyldiacetylenes reacted with phenylazide to produce only one 1-phenyl-4-trifluoromethyltriazole, with an alkyne group on the 5-carbon. Yields for diacetylenes were much smaller than those for monoacetylenes, probably due to steric effects. Reactions were conducted at 50°-80° for monoacetylenes, and 20° for diacetylenes, in ether, toluene or benzene. References 17: 7 Russian, 10 Western.
[285-12126]

UDC 541.127:542.924:547.592.15:543.8

COMPETITIVE SPLITTING OF N-N AND N-C BONDS IN ACID HYDROLYSIS OF N-NITROSOAMINES

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 26 Jun 84) pp 566-570

NIKULIN, V. N., KLOCHKOVA, V. N., PREOBRAZHENSKAYA, T. N. and SHTYAGINA, O. A., Kazan Institute of Chemical Technology imeni S. M. Kirov

[Abstract] Polarographic and UV spectroscopic techniques were employed in monitoring the course of hydrolysis of 1,3,5-trinitroso-1,3,5-triazacyclohexane by 0.05 to 1.00 M sulfuric acid. The kinetic data showed that the

reaction was dependent on the temperature and acid concentration, with the rate constant increasing from $5.2 \times 10^{-4} \text{ sec}^{-1}$ with 0.25 M H_2SO_4 , to $23.2 \times 10^{-4} \text{ sec}^{-1}$ with 1.00 M H_2SO_4 at 20°C. With sulfuric acid concentrations of 0.5 M or greater the initial step involved cleavage of one N-N bond with the formation of an intermediate product presumed to be dinitroso-1,3,5-triazacyclohexane. The latter is then hydrolyzed without splitting of the remaining two N-N bonds. Since formaldehyde was identified among the products, it was taken as an indication that the N-C bond in the ring was cleaved. On the basis of the rate constants and the data on the products, a reaction sequence was proposed to the hydrolysis of the starting N-nitrosoamine to formaldehyde and ammonia. Figures 2; references 4: 1 Czech, 1 Russian, 2 Western.
[327-12172]

REACTIVITY OF ORGANOTIN COMPOUNDS. REPORT 27. EXCHANGE PROCESSES IN REACTION OF ALPHA-STANYL COMPLEX ESTERS WITH IODINE IN PRESENCE OF ORGANOTIN IODIDES

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 21, No 5, May 85
(manuscript received 7 Mar 84) pp 921-926

KASHIN, A. N., TULCHINSKIY, M. L., BELETSKAYA, I. P. and REUTOV, O. A.

[Abstract] The reaction of R_3SnCH_2COOEt with iodine was studied in dimethyl formamide in the presence of KI and R'_3SnI . NMR and GLC demonstrated that only R_3SnI and ethyliodoacetate were formed. When R was ethyl or butyl, the reaction was first order in organotin substrate and in iodine. However, when R was phenyl, the reaction, while still first order in organotin compound, was zero order in iodine. This indicates that the reaction proceeds via radical exchange. This exchange was demonstrated by PMR of the reaction between Me_3SnCH_2COOEt and R'_3SnI , in the absence of iodinating agent. When R' was ethyl or butyl, 50-60% exchange was observed, while when R' was phenyl, exchange degree was 90% or more. Spectrophotometric measurement or I_3^- concentration was used to estimate the rate of exchange between Me_3SnCH_2COOEt and Ph_3SnI as 0.46 L/mole sec. The acceleration of the original reaction in the presence of Me_3SnI was due to the formation of the more active Me_3SnCH_2COOEt . Nonexchange processes are also involved. The results with Ph_3SnI can be explained if the enol intermediate is formed after the complex between R_3SnCH_2COOEt and R_3SnI , since Ph_3SnI is a stronger Lewis acid than Bu_3SnI . This mechanism takes all kinetic features of the reaction into consideration. The rate limiting step depends on the nature of the R and R' groups. In dimethylformamide, I_3^- complex is, by a factor of three, more active than Ph_3SnI . Figures 1; references 7: 2 Russian, 5 Western. [285-12126]

NEW METHOD FOR SYNTHESIS OF ALKYL VINYLTELLURIDES

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 21, No 5, May 85
(manuscript received 18 Sep 84) pp 1130-1131

TROFIMOV, B. A., POTAPOV, V. A., GUSAROVA, N. K., TATARINOVA, A. A. and AMOSOVA, S. V., Irkutsk Institute of Organic Chemistry, Siberian Department, USSR Academy of Sciences

[Abstract] Divinyltelluride was treated with lithium in ammonia and then with alkyl halides to give the corresponding vinylmethyl-, vinylethyl- or vinylpropyltellurides. The yield for vinylethyltelluride was 57%, while that for vinylpropyltelluride was 63%. Structures were confirmed by infrared spectroscopy, ^1H -NMR, ^{13}C -NMR, mass spectrometry and element analysis. References 2 (Russian).

[285-12126]

UDC 542.943.7:541.127:530.145:546.193'11-123:546.56-386

KINETICS AND MECHANISM OF OXIDATION OF ARSINE BY COPPER (II) HALIDE COMPLEXES

Moscow KINETIKA I KATALIZ in Russian Vol 26, No 3, May-Jun 85
(manuscript received 7 May 84) pp 615-620

DORFMAN, Ya. A., POLIMBETOVA, G. S., YEMEL'YANOVA, V. S., KEL'MAN, I. V., ABDREIMOVA, R. R. and DOROSHKEVICH, D. M., Institute of Organic Catalysis and Electrochemistry, Kazakh SSR Academy of Sciences, Alma-Ata

[Abstract] An analysis was conducted on the kinetics and the mechanism of oxidation of arsine by various Cu(II) halide complexes at 25°C. Under the reaction conditions employed, the $\text{CuX}_2\text{-HX-LiX-H}_2\text{O}$ system ($\text{X} = \text{I}, \text{Cl}$ or Br) resulted in the oxidation of AsH_3 to As(0) , with the reaction being first order in $[\text{CuX}_2]$ and close to first order in $[\text{AsH}_3]$. In terms of reactivity with AsH_3 the halides ranked as follows: $\text{CuCl}_{3\text{aq}}^- < \text{CuBr}_{\text{aq}}^+ <$

$\text{CuClI}_{\text{aq}} < \text{CuBr}_{3\text{aq}}^- < \text{CuCl}_2\text{I}_{\text{aq}}^- < \text{CuCl}_3\text{I}_{\text{aq}}^{2-}$. This sequence indicates that

the intermediate complexes which precede the transitional state consist of a central Cu(II) atom with the AsH_3 molecule, halogen ions, and water molecules as ligands. As a result, it appears that the limiting step in the reaction consists of the interaction of the AsH_3 molecule with the halogen to form a highly reactive AsH_2^\cdot radical. Figures 41; references 7 (Russian). [327-12172]

PESTICIDES

NATURAL WEED AND PEST CONTROL PROPOSED FOR LATVIAN AGRICULTURE

Riga NAUKA I TEKHNIKA in Russian No 6, Jun 85 pp 16-17

[Article by Uldis Kaulin'sh: "Once More About Chemicalization"]

[Text] Various chemicals are widely used for increasing agricultural productivity and improving crop yields. However, with time they may pollute the environment and cause harm to human health. Therefore, scientists are proposing the broader use of certain physiologically-active natural substances.

Compounds and mixtures containing mercury, arsenic, and copper, chloroorganic, organophosphorus and other herbicides, insecticides, fungicides and bactericides are actually very effective in controlling weeds, pests, and diseases caused by various microorganisms. Their application permits high yields to be obtained and reduces the cost of agricultural production. As attested by statistics, 30-50% of the world's crop yields are lost due to weeds, pests and diseases. The urging of some conservationists for totally eliminating the use of chemicals is highly unrealistic. In the first place, in the opinion of competent scientists, this would noticeably increase the costs of the products. In the second place, the hope of a quantitative increase in the number of laborers and of a flow of labor to the country [rural areas] are scarcely practical. In the third place, organizational foulups, poorly thought out ideas and the lack of awareness on the part of the owners of certain plots inflict far more damage than do chemicals.

Nevertheless, environmental pollution continues. Therefore, scientists and practitioners are seeking new chemical compounds and ways of intensifying agriculture.

One such possibility is the bold use of the protective agents of nature itself and the activation of the defensive forces of the plants. Contrary to the beliefs of certain practitioners, the reserves of many natural compounds are far from small and their isolation represents no particular problem. For instance, some are obtained in the process of improving the quality of food products (chlorogenic acid, protein, phospholipids etc.) while others may be manufactured from the waste products of agricultural production, e.g., tomato sprouts (tomatin), during the production of starch, from the waste waters of milk and meat processing plants, and sanitation wastes.

It appears most profitable to utilize certain wild plants and their extracts. From time immemorial until 1850 about 12 types of plants were used in the Mediterranean countries to control pests: lupine and elder to repel insects, walnuts (together with oil) for repelling ants, the leaves and extract from the shells of walnuts against earthworms and larvae. Now we know that this extract destroys aphids, and the juglone prepared from walnut shells in pure form is a strong antioxidant and fungicide. Many of the plants used earlier are well known today, e.g., Veratrum (written about in detail in the 9th issue of "Nauka i Zhizn'" for 1984). The extract from Veratrum roots is used to spray apple trees against apple tortrix moths, the large white butterfly (*Pieris brassicae*) and the beet pest. Aconite is good against mice, rats and reptiles, delphinium (*Pedicularis* sp., lousewort) is effective against human parasites, wormwood for repelling pests and protecting grain crops, because insects cannot tolerate the mixture of physiologically active substances contained in wormwood, orpine is used to destroy houseflies (to be sure this method is unknown to the author). Such plants as chervil, henbane, and aconite are very dangerous, and others should be handled in the same manner as harmful substances—with extreme caution, e. g., when preparing the powder or decoction from false hellebore (*Veratrum*)).

Besides the complex natural protective systems, we also have "newly discovered" nontoxic plants at our disposal. Thus, in Japan a patent (!) in which macerated garlic in water was disclosed as a means for controlling pathogenic fungi. The powder or oil from garlic can also be applied. Fruits treated with garlic juice (ten minutes with a 5-20% solution) were much more resistant to fruit rot even when infected with a pure culture of the fungus. It is believed that the active ingredient in this case is diallyldisulfide. The widespread use of this useful plant is inhibited to some degree by its specific pungent odor, and therefore garlic should be kept for one half hour in a 0.1 to 5% solution of fumaric acid or used in a mixture with it.

Crop losses throughout the year caused by various factors (according to G. Kramer)

| Crops | Losses | |
|-------------------------------|---------------------|---------------------|
| | in millions of tons | % of possible yield |
| Cereal grains | 506 | 35 |
| Sugar beets and cane | 636 | 45 |
| Potatoes | 129 | 32 |
| Vegetables | 78 | 38 |
| Oilseed | 42 | 32 |
| Fruits, citrus fruits, grapes | 56 | 29 |

In an experimental test of onion, honey, and garlic for antibiotic properties, the onion and honey proved to be the most effective (against *Streptococcus faecalis* and *E. coli*).

Hop extracts are highly effective against fungi and gram-positive bacteria.

Under the conditions of Latvia, particular attention should be devoted to propolis which, according to its composition, is a concentrate of physiologically active natural compounds and contains approximately 17 different substances, including caffeic and fumaric acids and quercetine esters. Propolis suppresses the growth and development of many microorganisms, and its value is increased in the case when the microorganisms have become resistant to antibiotics.

In medical practice, it is commonplace to use an alcohol or oil solution of propolis. According to a Danish patent, one can also use an aqueous solution by boiling the propolis in water (1:300) containing the salt of a metal, e.g., magnesium gluconate and kitchen salt. In the food industry and alcohol solution of propolis is used to preserve juices and dry and semi-dry wines.

For repelling rodents one can use the resinous waste products from the production of theophytin (Patent No. 904, 209). According to the author's data, this agent is especially effective for protecting the branches of apple trees against field mice. The flavonoids contained in birch leaves possess a peculiar action--they protect young leaves against microorganisms (Is this not the secret of the birch broom?) and against ultraviolet rays.

Substances obtained both from plants and by synthesis may prove to be promising fungicides and bactericides.

We have already written about chlorogenic acid and its significance in the plant world (*Nauka i tekhnika*, No 8, 1984). The journal "Lauku Dzive" (Rural Life) has frequently contained articles on the plant steroid tomatin, the acid extracts of young tomato leaves and sprouts. Phospholipids are widely used abroad.

The specialists of the Baltic Branch of the All Union Institute for Plant Protection, the Priyekul Experimental-Selection Station, and the Dzimtene Kolkhoz of the Talsinskiy Rayon have proven that although these compounds represent fungistatic substances, they may also be used prophylactically in agriculture.

Experiments with spices testify that these substances have the ability to act on microorganisms, and the pure aldehyde of cinnamic acid, even in a concentration of 1 mg/liter, is more active than the widely-used sorbic acid and its salts.

One should also not forget that all of these compounds may be plant growth regulators.

The wisest approach to controlling and protecting crops is the "provocation" of the immuno-defensive systems of the plants or the suppression of those systems which attract pests and stimulate the growth of microorganisms. Thus, for example, it has been discovered that the infection of wheat, during its blossoming, with *S. graminearum* stimulates the glycinebetaine and choline present in the pollen, which are highly effective fungus growth stimulants.

Enzyme preparations are gaining great significance in agriculture and food technology. It has been proposed that they be introduced into the compositions used against cucumber fungus ["sticky dew of cucumbers"] and a multitude of other pathogenic fungi including the well-known [enzymes] pepsin, trypsin and papaine, and their application separately or jointly with sorbic, benzoic, and propionic acids or their salts, formic acid, and other components.

The number of substances and methods of application is constantly increasing. The task of the agricultural specialists of the republic is--in cooperation with chemists and producers--to devise and perfect methods for producing these active compounds or compositions in our republic as well.

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CSO: 1841/313

ACYLATION OF 2N(METHYL)-3-AMINOQUINAZOLONE-4

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 28 May 84) pp 81-82

ABDULLAYEV, N. P. and SHAKHIDOVATOV, Kh. M., Order of Labor Red Banner
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[Abstract] Both 3-amino-quinazolone-4 and its 2-methyl derivative were reacted with the methyl ester of chlorocarbonic acid and with the chloroanhydrides of the following acids: acetic, isovalerianic, benzoic, p-nitrobenzoic, p-bromobenzoic, and pyromucic. These reactions produced the corresponding acylquinazolones, which were colorless crystalline powders insoluble in water but soluble in ethanol, acetone, benzene, dimethylformamide and dimethylsulfoxide. An acceptor for hydrogen chloride was not needed--the nitrogen atom in position 1 of the quinazoline ring played this role. References 4 (Western).

[310-12672]

FUTURE PETROCHEMISTRY

Moscow BUDUSHCHEYE NEFTEKHIMII (NOVOYE V ZHIZNI, NAUKE, TEKHNIKE: SERIYA "KHIMIYA") in Russian No 2, Feb 85, pp 2-5, 47

[Annotation, introduction and table of contents from journal "Khimiya", issue entitled "Future Petrochemistry", by Boris Abramovich Krentsel', Izdatel'stvo "Znaniye", 1985, 28,500 copies, 48 pages]

[Text] Annotation

Boris Abramovich Krentsel' is a doctor of chemical sciences, professor, Lenin Prize winner and director of the laboratory for olefin polymerization at the Institute of Petrochemical Synthesis imeni A. V. Topchiyev of the USSR Academy of Sciences. He is one of the leading scientists in the field of petrochemistry and chemistry of high molecular weight compounds. He is the author of many scientific works, inventions and books on various conversions of hydrocarbons and their derivatives.

This journal, which is in popular form and accessible to a wide circle of readers, reflects fundamental tendencies of the development of petrochemistry in our country and abroad. Petrochemistry is examined as a complex process of converting hydrocarbons and other components of petroleum into products of high chemical value.

It reveals prospects and methods for developing petrochemistry in the near future and contemporary approaches for solving problems of raw material resources.

This issue is addressed to lecturers, instructors and students of peoples universities.

Introduction What Petrochemistry Is, How It Developed and What It Studies

Petrochemistry was conceived as an independent field of chemical knowledge comparatively recently; it is not yet 100 years old. There is every reason to consider one of the founders of petrochemistry, a man who has played a decisive role in its creation and development, to be Dmitriy Ivanovich Mendeleev, whose 150th birthday was recently observed by the entire civilized world.

D. I. Mendeleev paid most serious attention to problems of using petroleum not as (or not only as) fuel, but as raw material for obtaining valuable chemical products. He believed that petroleum should be used to its fullest, even for fuel. Mendeleev wrote in one of his works, "To heat with petroleum residue does not mean to heat with straw, but it is all the same if one heats with only the shaken off sheaves, provided by the ripest grain; those who would burn straw, not having beat it out as thoroughly as possible, would be called terrible farmers. The same must be said about petroleum residue."

D. I. Mendeleev's popular phrase about petroleum, "One may also heat with currency", is well-known. Mendeleev's idea does not imply in any way that petroleum should not be viewed as the most important natural fuel resource, extremely necessary for the development of industry in all of its multiformity. He meant that investigators and manufacturers should turn their attention to the possibility of the chemical usage of petroleum.

Mendeleev believed that petroleum is valuable raw material for preparing expensive organic products. He not only wrote about the chemical conversions of petroleum, he made the first practical strides along this path. On Mendeleev's initiative, the Konstantinov Plant (near Yaroslavl') produced aromatic hydrocarbons from petroleum and conducted laboratory experiments on the synthesis of semifinished products for dyes. There they also investigated oxidation processes of petroleum products in an apparatus constructed especially for this.

Speaking of the necessity of thoroughly developing petroleum science, D. I. Mendeleev pointed out that "expenditures on science are worth it, because it foresees much earlier, anticipates, analyzes the possible and selects what is essential from the mass of practical details." In our time, when science has become a productive force, we can only admire the insight of this great Russian scientist.

It is necessary to note that, concerning the chemical use of petroleum products and the wide circle of scientific investigations designed to further this goal, D. I. Mendeleev fought for serious attention to physical questions, and he brought to mind the famous statement of M. V. Lomonosov, who believed that "a chemist without knowledge of physics is similar to a man who must always grope his way along."

D. I. Mendeleev was the first investigator who seriously studied the physical properties of semifinished products. His pioneering works were continued much later by other scientists.

Keeping in mind the prospect of developing various chemical conversions of petroleum distillates (for such a long time they were called petroleum fractions which were evaporated by boiling in specific ranges), studying petroleum and petroleum products must be of foremost significance.

This problem is not resolved simply, in so far as petroleum (in a generalized meaning of this natural wealth) consists of various hydrocarbons, which belong

to many classes of organic compounds, and also components whose molecules, along with atoms of carbon and hydrogen, contain atoms of sulfur, nitrogen and other elements (these compounds are called heteroatomic).

In Mendeleev's time, the composition of petroleum could not be studied in detail, and decades were required before this problem of studying the composition and properties of petroleum to a specific, as yet imperfect degree, could be resolved.

One of the greatest chemists of all time, V. V. Markovnikov, must be mentioned first as one of the initial researchers. He gave special attention to Caucasus petroleum, which contains a notable quantity of naphthenic hydrocarbons.

The cycle of investigations which V. V. Markovnikov began were then continued in the 1920's and 1930's by N. D. Zelinskiy, S. S. Nametkin and their many scientists and associates. In his classical work "Petroleum Chemistry", S. S. Nametkin gives detailed characteristics of well-known books on the composition of various petroleum and existing methods of studying them.

I must point out that at that time, modern physical-chemical, and, in particular, spectroscopic and chromatographic methods of studying petroleum had not been developed yet, and now, as a matter of fact, a large division of petrochemistry has been created, which is the study of the composition and properties of hydrocarbon and nonhydrocarbon components of petroleum. However, this question on its own is so fundamental that it cannot be examined within the framework of this book.

We shall return to the essence of the concept of "petrochemistry" and its content. In the book I just mentioned, "Petroleum Chemistry", S. S. Nametkin defined petrochemistry as processes of converting petroleum hydrocarbons into products of higher chemical value. With this definition he hoped to emphasize the fact that our efforts must be directed toward solving, in their theoretical and practical aspects, problems of using the arsenal of chemical reactions for converting petroleum hydrocarbons into products which are valuable to the national economy.

Petroleum and petroleum gases are invaluable sources of hydrocarbon raw material in comparison to other fossil fuels, which is not difficult to believe after examining the presented data (table 1).

Table 1. Elemental Composition of Various Fossil Fuels

| Fossil Fuels | C, % | H, % |
|------------------|---------|---------|
| Anthracite | 95 | 2.5 |
| Coal and Lignite | 85 | 5.4 |
| Petroleum | 84---87 | 12---13 |
| Gas | 75 | 25 |

These data sufficiently characterize the advantage of petroleum and gas when using them as sources of hydrocarbon raw material. On the other hand, the limitedness of petroleum resources, which are available to mankind, makes it necessary to form scientific developments and accomplishments in the practice of more effective methods of using hydrocarbons which guarantee maximum economy of petroleum raw material.

Thus, petrochemistry is a complex of chemical and physical-chemical conversions of hydrocarbons and other components of petroleum and gases into various products of both multi-tonnage (high-octane components of fuels, polyolefins, rubbers, oxygen-containing and other products) and comparatively low-tonnage organic synthesis, including that used for medical purposes.

This definition is basis enough to consider petrochemistry a division of organic chemistry. Such a concept is accurate. However, it is necessary to keep the following circumstances in mind.

1. Petrochemistry uses complex liquid and gas mixtures as original raw material and often obtains them in the form of semifinished products; their division requires special methods.
2. Petrochemistry is continuously linked to one of the largest sectors of the national economy, oil refining and petrochemical industry, which determines, to a certain degree, the industrial potential of our nation's national economy as a whole.
3. Petrochemistry includes special divisions of homogenous and heterogenous catalysis, the creation of new possibilities of the most complete usage of petroleum strata, the application of special physical approaches, and the extraction of synthetic petroleum from other forms of raw material.

It is namely these circumstances which make it possible to examine petrochemistry as an independent field of chemical knowledge, not in any way disregarding its closest ties to organic, physical and bioorganic chemistry, which significantly determine the development of petrochemistry in the future.

Petrochemistry is the chemical division of the study of petroleum, the basic principles of which were formed and developed in their time by I. M. Gubkin.

Petrochemistry is a science which serves the oil refining and petrochemical industry, and therefore its current development and future prospects are determined, to a certain degree, by features of the technical progress of this sector of the national economy, depending, in its turn, on changes in the fuel-energy balance of industry as a whole.

The development of organic catalysis and the infusion of physical methods of this effect on a substance has introduced many new facets into petrochemistry and has broadened its horizons. Our pamphlet deals with these questions and attempts to explain, to a wide circle of readers, the prospects and courses of development of petrochemistry in the near future.

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CSO: 1841/298

UDC: 665.637.7:665.754.4

INCREASING YIELD OF LIQUID PARAFFINS IN CARBAMIDE DEPARAFFINIZATION

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85,
pp 4-5

BABAYEV, I. D., ISMAYLOV, A. G., GAMIDOVA, S. K. and BUKHMAN, I. F.,
Institute of Petrochemical Production, AzSSR Academy of Sciences.

[Abstract] A study was performed to select optimal conditions for deparaffinization of the hydropurified fraction of diesel fuel made from a mixture of crude oils to produce type DZ diesel fuel for temperate and cold climates and achieve the maximum extraction of liquid paraffins. Only the content of carbamide in solution and volumetric ratio of solution to raw material were varied in the studies. Tables illustrate the results produced at the various temperatures and ratios.

[297-6508]

UDC: 622.691.4.052:66.074:629.113/114

DRYING OF COMPRESSED NATURAL GAS WITH SILICA GEL

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85,
pp 9-10

VYALKINA, G. V., NABUTOVSKIY, Z. A., POPOV, V. I. and TUREVSKIY, Ye. N.,
All-Union Scientific Research Institute of Gas

[Abstract] A study was made of the drying of gas by silica gel at 20 MPa and regeneration of the silica gel at 20-80°C in a pilot scale installation. In all experiments the dew point of the gas was reduced to -30°C or lower at 20 MPa. As regeneration temperature was increased and the quantity of gas processed rose, the time required to achieve the maximum degree of drying in the subsequent drying cycle decreased. In the process of drying natural gas at high pressure, C₅ and higher hydrocarbons do not accumulate in the silica gel. The possibility is thus demonstrated of drying compressed natural gas on silica gel and regenerating the silica gel using the heat of

the natural gas, decreasing the consumption of electric power and the cost of the gas as a fuel for gas powered vehicles. Figures 2; references 2 (Russian).
[297-6508]

UDC: 665.554.621.43.068.4

PRODUCTION OF LOW-AROMATIC, HIGH-OCTANE MOTOR VEHICLE FUEL COMPONENTS

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 10-12

BORTOV, V. Yu., GEORGIYEVSKHIY, V. Yu., SHIPIKIN, V. V., TANATAROV, M. A. and AKHMETOV, A. F., 'Lenneftekhim' Scientific-Production Association, Ufa Institute of Petroleum

[Abstract] A study was made of the influence of hydroisomerization parameters of the low boiling (115°C) fraction of reforming catalysates on the detonation properties of the hydroisomerizate and gasoline obtained by mixing the hydroisomerizate with the other fractions. Studies were performed on a pilot-scale installation with circulation of water-containing gas at a temperature of 200-430°C, pressure 3 MPa and volumetric raw material feed rate 2 hr⁻¹. In all experiments the hydroisomerizate yield was near quantitative, i.e., hydrocracking of the hydrocarbons did not occur. The fuels obtained were similar in antiknock qualities to the initial reformat or superior to it. The content of aromatic hydrocarbons was 10% lower by weight due to hydrogenation of lower aromatic hydrocarbons. Figures 3; references 2 (Russian).
[297-6508]

UDC: 661.183.4:661.862.22:665.66

ADSORBENTS FOR PURIFICATION OF AROMATIC HYDROCARBONS

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 13-15

ALEKSEYEVA, R. V., KUVAYEVA, M. M., KHARITONOVA, L. K. and SOBOZU, M. Sh., Krasnodar Branch, 'Lenneftekhim' Scientific-Production Association.

[Abstract] A study is made of the possibility of replacing imported adsorbents with domestic ones in installations for production of aromatic hydrocarbons. Studies were performed on natural adsorbent type A-4M, a synthetic small spherical aluminosilicate adsorbent and aluminosilicate crushed catalyst. Two series-connected reactors operating at 170-230°C, pressure 0.6-2.5 MPa, space velocity about 1 hr⁻¹, were used. The purification process is performed in the liquid phase. Effectiveness of the

adsorbent was evaluated on the basis of depth of purification from impurity components and quantity of raw material purified by a unit mass of adsorbent. Specific surface and total acidity had the greatest influence on degree of purification and service life. Results allow recommendation of natural adsorbent A-4M to replace the imported adsorbents. References 3 (Russian). [297-6508]

UDC: 66.022.311.38

SOME REGULARITIES OF SELECTION OF ANTIFRICTION ADDITIVES FOR OILS

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 15-17

LASHKHI, V. L., SHOR, G. I., BUYANOVSKIY, I. A., BORENKO, L. V. and LIKHTEROV, S. D.

[Abstract] A study is made of the relationship between friction parameters and properties of a lubricant medium under boundary friction conditions based on the principles of solid state thermodynamics. The factors determining the coefficient of friction in a lubricated couple are explained. The accuracy of estimation of the antifriction effect of an additive can be significantly increased by using methods which consider the specifics of the process occurring at the phase division boundary. This allows the production of comprehensive information on the parameter studied, as well as its prediction. Figures 2; references 9 (Russian). [297-6508]

UDC: 621.892.6.86

INFLUENCE OF POLYMER AND ESTER ADDITIVES ON LUBRICATING PROPERTIES OF OILS FOR LIQUID FRICTION BEARINGS

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 20-22

GRIGOR'EVA, N. I., BADYSHTOVA, K. M., SHCHEKURIN, O. O. and KOLOBOV, N. I., KF, All-Union Scientific Research Institute of Petroleum Production, [KF = Krasnodar Branch?]; 'Elektrostal'tyazhmash' Production Association.

[Abstract] A study is made of polyisobutylenes of various molecular masses and esters containing no active elements as additives intended to increase the load-bearing capacity of the viscous oil used in liquid friction bearings. Results are presented from tests in steel-babbit friction couples of the antifriction properties and load-bearing capacity of P-28 and M-20 A oils with various additives: polyisobutylene, pentaerythrite ester and C₅- and C₇ synthetic fatty acid, dioctyl sebacinate and diethylmaleate.

The method of study was to determine the coefficient of friction of the elements of the friction couple with various combinations of materials at a constant slipping speed over a broad range of loads and temperatures. The results of the studies showed that the nature of the change in coefficient of friction as a function of specific load was the same for all additives: decreasing up to 12 MPa, then increasing. The polyisobutylenes were more effective in terms of their influence on the antifriction properties and load-bearing capacity of the oils than ester additives. Figures 2; references 11: 8 Russian, 3 Western.
[297-6508]

UDC: 665.765-404.038.001.5

CUMYLPHENOL AS ANTIOXIDANT ADDITIVE FOR OILS

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 27-28

TIUNOVA, I. M., BALLYAKINA, L. N., ZANOZINA, I. I. and TYSHCHENKO, V. A., Kuybyshev Branch, All-Union Scientific Research Institute of Petroleum Production.

[Abstract] Studies performed on a thermal analyzer in a current of helium showed that cumylphenol is more thermally stable than ionol: the temperature at which mass loss begins is 125°C for cumylphenol, 70°C for ionol, the temperature at which endothermic effects begin to be observed is 200°C for cumylphenol, 100°C for ionol. The effectiveness of cumylphenol as an antioxidant additive was studied in comparison with ionol in oils from Balakhan petroleum. Thermal and gas chromatographic methods were used to evaluate thermal oxidative stability. Cumylphenol is recommended as an antioxidant additive for industrial oils. Figures 1; references 5 (Russian).
[297-6508]

UDC: 665.61[571.5]:665.61.03

FIRST PETROLEUM OF CHUKOTKI

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 32-33

ARENBRISTER, L. P., DEMIDENKO, K. A. and ZHEMYKHOVA, N. M., All-Union Scientific Research Institute of Petroleum Production.

[Abstract] The first petroleum deposit of Chukotka is the Verkhne-Echinskoye, located in Magadan Oblast 140 km southwest of Anadyr'. The physical and chemical properties of the petroleum taken from Neogene deposits

at a depth of 1486-1443 m are presented in a table. The petroleum is distinguished by its low sulfur content and low content of resin-asphalt substances, high content of paraffin (19.5%) and high yield of light fractions up to 350°C (63.8% by mass). Thus, the petroleum is a light, low-sulfur, low-tar, high-paraffin crude. Jet fuel and summer diesel fuel with low sulfur content, plus high index base oil, liquid and solid paraffins can be obtained from the petroleum. References 3 (Russian).
[297-6508]

UDC: 543.062.253

DETERMINATION OF LEAD CONTENT IN ETHYLATED GASOLINES

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85, p 34

DANILOV, O. A. and GRISHIN, A. P., Groznensk Institute of Petroleum imeni M. D. Millionshchekov

[Abstract] A combined method is suggested for determination of tetraethyl lead, consisting of decomposition of the tetraethyl lead with iodine and determination of lead by oscillographic polarography. The oxidizer of reducing agent is significantly more effective at the moment of formation (separation). Decomposition of tetraethyl lead is performed by successive addition of HCl, KI and KIO_3 . The iodine liberated in the course of the reaction in the concentrated acid medium breaks down the tetraethyl lead. Gasolines with various lead contents were used in the analysis. Analysis time is about 30 minutes. References 7: 3 Russian, 4 Western.
[297-6508]

UDC: 621.892.339.443

DETERMINATION OF EFFECTIVE LUBRICANT CHANGE INTERVAL IN AIRCRAFT CHASSIS JOINTS

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 35-36

UGRYUMOV, V. S. and BEDRIK, B. G.

[Abstract] An equation is suggested for determination of the maximum interval between changing of lubricant in the joints of aircraft chassis. The maximum time is determined by testing of lubricants under conditions modeling the operation of actual friction couples. In practice, the maximum time can be determined from nomograms. An example nomogram is presented. The maximum permissible interval between changes of lubricants is determined from the most heavily loaded joint in the chassis. Figures 1; references 3 (Russian).
[297-6508]

DECONTAMINATION OF SULFUR-ALKALINE WASTE ON HETEROGENEOUS PHTHALOCYANINE CATALYST

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 5, May 85, pp 36-38

AKHMADULLINA, A. G., MAZGAROV, A. M., KHRUSHCHEVA, I. K. and NURGALIYEVA, G. M., All-Union Scientific Research Institute of Hydrocarbon Raw Materials.

[Abstract] The authors' institute, in cooperation with the Ivanovo Institute of Chemical Technology, has developed a heterogeneous phthalocyanine purification catalyst with good chemical stability, mechanical strength and stable catalytic activity. It is produced in the form of granules which are then used to manufacture packing elements with well-developed geometric surface, such as Rashig rings. A process of heterogeneous catalytic oxidative decontamination of sulfur-alkaline wastes on the new catalyst has been developed. The process consists of oxidation of sodium sulfide with oxygen from the air to yield less harmful sodium thiosulfate and sulfate, while sodium mercaptides are oxidized to organic disulfides which are insoluble in the sulfur-alkaline wastes and can be separated by settling in oil traps. The reactions of oxidation of sulfide and mercaptide in the kinetic area are first order reactions with respect to sulfide and mercaptide, oxygen and the catalyst. The process is performed at 40-50°C, pressure 0.3-0.5 MPa. The expected economic effect from introduction of the process of liquid phase oxidative decontamination of these wastes to replace the carbonization process presently used is 68,000 rubles per year on an installation with a capacity of 10,000 tons per year. Figures 1; references 8 (Russian). [297-6508]

CONVERSION OF LCh-24/2000 INSTALLATION TO HYDROPURIFICATION OF AVIATION KEROSENE

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 5, May 85, p 38

DYNYASHKINA, E. F. and KOLOTVINA, L. Ye., Lengiproneftekhim.

[Abstract] Lengiproneftekhim has developed recommendations for the use of the LCh-24/2000 installation, designed for hydropurification of diesel fuel fractions, for the hydropurification of aviation kerosene. The installation is suitable for this purpose, since the hydropurification conditions of kerosene fractions are milder than those of diesel fuel fractions. The conversion requires the purchase of a unit for input of additives to improve the antiwear and antioxidant properties of the kerosene and provision for 36 hour settling of kerosene before the additives are introduced. [297-6508]

EFFECT OF DIESEL FUEL FLASH POINT TEMPERATURE ON ITS PRODUCTION RESOURCES

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 pp 5-6

MITUSOVA, T. N., NIKOLAYEVA, V. G. and VERETENNIKOVA, T. N.

[Abstract] The flash point temperature of various fuels is a function of their content of low boiling fractions. The effect of the flash point temperature on production resources of diesel fuels was studied, reviewing and analyzing data on 86 specimens from various petroleum deposits in the USSR. It was shown that a 1°C increase in flash point temperature of a diesel fuel (whose yield is 42% based on the starting crude oil) lowers its yield by 0.3% based on the crude oil or by 1.26% based on the fuel itself. Therefore, attempts to elevate the flash point temperature of diesel fuels above 65°C will invariably lead to a drop in production of this fuel.

Figures 1; references 1 (Russian).

[325-7813]

EXPERIENCE GAINED ON SELECTIVE HYDROCRACKING PLANT L-35-5

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 pp 6-8

BORTOV, V. Yu., SHIPIKIN, V. V., SEMENOVA, V. F., SHAFRANSKIY, Ye. L., VASIL'YEVA, M. N. and GEORGIYEVSKIY, V. Yu., Novokuybyshev Petroleum Processing Plant; "Lenneftekhim Scientific Production Association

[Abstract] The experience gained in using the selective hydrocracking equipment L-35-5 at the Novokuybyshev Petroleum Processing Plant showed that the catalyst used was very active and selective; it could be easily regenerated after exposure to catalytic poisons. The yield of the product was over 80% with the octane number exceeding the crude octane by 13-19 points. Specific indices of this process were reported in text and graphically. Figures 1; references 2 (Russian).

[325-7813]

EFFECT OF THERMAL AIR AND THERMAL VAPOR TREATMENT ON ACTIVITY OF SHS
CRACKING CATALYSTS

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 pp 11-12

VOLKOV, V. Yu., LIPKIND, B. A. (deceased) and KALIKO, M. A.

[Abstract] SHS catalysts (super high silicon catalysts) are important components of cracking catalysts. The goal of this work was to investigate the effect of thermal air and thermal vapor treatment conditions on the activity of SHS zeolites and catalysts obtained from them during cracking of crude hydrocarbons. Thermal vapor treatment of SHS zeolites intensified hydrophobic properties of their surfaces resulting in lesser conversions of n-heptane on SHS catalysts. Selectivity of SHS catalysts towards paraffin cracking increased after thermal steam treatment. Thus, varying the conditions for catalyst treatment along with the rate of paraffin passage, one can reach an adequate stability of the catalytic activity and increase the selectivity towards the production of olefins. References 9: 5 Russian, 4 Western.

[325-7813]

HYDRODEAROMATIZATION OF LIQUID PARAFFINS OVER PALLADIUM-ZEOLITE CATALYSTS

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 pp 13-14

KASTERIN, V. N., DOROGOCHINSKIY, A. Z., YESIPKO, Ye. A. and
GONCHARENKO, A. D., Groznensk Scientific Research Institute; Groznensh
Petroleum Institute imeni M. D. Millionshchikov

[Abstract] The effect of molar ratio of $\text{SiO}_2:\text{Al}_2\text{O}_3$ in the carrier of NaY palladium-containing catalysts on hydrogenation effectiveness of aromatic hydrocarbons in liquid paraffins obtained by adsorption in a boiling liquid of zeolite was studied. It was shown that an increase in the $\text{SiO}_2:\text{Al}_2\text{O}_3$ ratio from 3.8 to 5 led to substantial increase of the conversion of aromatic hydrocarbons in liquid paraffins. The data obtained could be used for development of new palladium-zeolite catalysts for use in hydrodearomatization of liquid paraffins. Figures 1; references 4 (Russian).

[325-7813]

THERMOOXIDATIVE STABILITY OF DIESEL FUELS

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 pp 16-18

GUREYEV, A. A. and FRIGUL'SKIY, G. B., Moscow Institute of Petrochemistry and Gas Processing imeni I. M. Gubkin

[Abstract] Results of the study of thermooxidative stability of diesel fuels under static and dynamic conditions are reported. It was shown that this thermooxidative stability goes through a minimum at 180-190°C. Addition of up to 20% of gas-oil from catalytic cracking significantly lowered this stability. Hydropurified diesel oil showed a much higher thermal stability than the directly distilled oil. Hence, hydropurification or the use of additives was advocated as a means for improving thermooxidative stability of diesel fuels. Figures 1; references 7 (Russian).

[325-7813]

UDC 665.61.03(574)

PETROLEUM FROM KULTUK DEPOSITS

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 pp 24-25

DOROGOCHINSKAYA, V. A., SHUL'ZHENKO, E. D., VARSHAVER, V. P. and GUMAROVA, A. K., Groznensk Scientific Research Institute

[Abstract] Petroleum from Kultuk deposits (KazSSR) located in northern Mangyshlak peninsula differs substantially from the heavy, tarry petroleum with high sulfur content obtained from neighboring deposits in Kalamkas and Karazhanbas. This petroleum is light, nonviscous, containing low levels of sulfur, paraffin and tarry substances; its oxidification point is low. Detailed physical properties of individual cracking fractions are reported and tabulated. According to the OST 38.01197-80 standards, the index of this petroleum is 1.1.4.2.1.

[325-7813]

KINETICS OF LIQUID PHASE ADSORPTION OF INDIVIDUAL HYDROCARBONS ON ZEOLITE NaY

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 p 40

ANDREYEV, S. L., BEREZUTSKIY, V. M., LARIONOV, O. G. and CHEREDNICHENKO, O. A., Groznensk Scientific Research Institute

[Abstract] Kinetics of the adsorption of individual hydrocarbons on a zeolite NaY was studied by the method of liquid column chromatography determining the contribution of kinetic wash-out to the height of equivalent theoretical plate and the coefficient of diffusion. It was shown that the diameter of zeolite granules filling the column had no effect on the coefficient of diffusion. The most direct method of increasing the effectiveness of a layer of NaY zeolite was to use the adsorbent with the smallest diameter possible: kinetic wash-out is a function of the square of the granule diameter. Decreased molecular weight of the n-alkane eluent and increased temperature showed no effect on the performance of zeolite columns. Figures 2; references 5 (Russian, 1 by Western author).
[325-7813]

UDC 665.654.2

CATALYSTS FOR HYDROCRACKING OF VACUUM DISTILLATE

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 6, Jun 85 pp 40-41

GONCHAROVA, N. V., BULEKOVA, Ye. A., KRUGLIKOV, V. Ya. and PEREZHIGINA, I. Ya.

[Abstract] Hydrocracking conditions which exist in operations over the catalyst GK-60 (a catalyst based on an amorphous base containing nickel and molybdenum compounds) was studied. Its specific property is its selectivity towards the formation of middle distillate fuel fractions during hydrocracking. Analysis of experimental data showed good isomerising activity of GK-60 catalyst: solidification temperature of winter diesel fuel--minus 52° C and of the summer oil minus 34° C. Fractions boiling above 360° C yielded lubricants with viscosity index above 120. No decrease in activity or selectivity was observed even after 400 hrs of use.
[325-7813]

UDC: 630*864:66.095

COMPOSITION OF SOLUBLE PRODUCTS OBTAINED BY ALKALINE PROCESSING OF HYDROLYSIS LIGNINS IN PRODUCTION OF MEDICINAL LIGNIN

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2, Feb-Mar 85, pp 10-11

LEVANOVA, V. P., candidate of technical sciences, BOYKO, T. A., senior scientist and ARTEM'YEVA, I. S., candidate of chemical sciences, All-Union Scientific Research Institute of Hydrolysis.

[Abstract] Solutions obtained after cooking specimens of hydrolysis lignin, containing 12.6 to 49.5% polysaccharides, were studied. Cooking was performed at 20 to 100°C in the presence of 1 to 2% caustic soda. The reaction mixture was placed in a Buchner funnel and alkali filtered away under a vacuum, the residue on the filter washed three times with water. The alkali and wash water were analyzed separately. It was found that the quantity of alkali filtered off depends on the lignin composition. Under the conditions studied, salts of organic acids are formed, the quantity of which depends primarily on the reaction temperature and lignin composition. The results obtained in the study indicate the nature of processes occurring during alkaline processing of hydrolysis lignins with varying polysaccharide content, the quantity of alkali and salts which can be removed from the alkaline lignin by washing with water and the quantity of alkali bonded by the lignin. Figures 3; references 2 (Russian). [294-6508]

SEPARATION OF WATER-DIOXANE SOLUTIONS BY EVAPORATION THROUGH POLYETHYLENE TEREPHTHALATE

Moscow VESTNIK MOSKOVOSOGO UNIVERSITETA: SERIYA 2 KHIMIYA in Russian
Vol 26, No 2, Mar-Apr 85 (manuscript received 8 Dec 83) pp 153-157

AGEYEV, Ye. P., SAVEL'YEVA, N. N. and STRUSOVKAYA, N. L., Department of
Physical Chemistry [Moscow State University]

[Abstract] The separation of water-dioxane solutions by evaporation through amorphous crystalline polyethylene terephthalate films and membranes was studied. Crystallization set in at lower dioxane concentrations for membranes than for films, indicating that mechanical tension facilitates crystallization. Films which were soaked in crystallizing solution exhibited first a decrease in crystallinity and then a sharp increase. Full solvent desorption was not possible, indicating that the liquid molecules may be occluded in the crystalline area. The presence of stilbene in the solvent decreased adsorption. The permeability of membranes in contact with solutions of a single composition was unchanged by preliminary soaking and independent of degree of crystallinity. Permeability exhibited a maximum at around 30% dioxane; above 40% the membranes lost mechanical stability. In all cases more water than dioxane penetrated the membrane, probably by capillary action in locally crystalline areas. The presence of tropealine dye decreased permeability, but did not abolish selectivity. Successive use of the same membrane improved mechanical stability and selectivity. Figures 3; references 7: 3 Russian, 4 Western.
[269-12126]

CATALYSIS OF MODIFIED POLYURETHANES

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 6-8

SHIMANSKIY, V. M., TEODOROVICH, D. A., GOLUSHKOVA, L. P. and ZHURAVLEVA, R. T.

[Abstract] Polyurethane compositions modified with methylmethacrylate require long curing times (several days) owing to the differences in the reaction kinetics of the urethane and modifier. A study of the kinetics of the system shows that aminoalkylmethacrylate compounds (e.g. dimethylaminoethylmethacrylate) containing both a tertiary nitrogen atom (amine) and a vinyl group (methacrylate) are capable of catalyzing simultaneously the reactions of polyurethane formation and radical polymerization of methacrylate, thereby shortening the curing time. The structure of this catalyst (size and shape of the radicals) apparently has no effect on the kinetics.

Figures 1; references 10: 8 Russian, 2 Western.

[302-12765]

ESTERIFICATION REACTION OF PELARGONIC ACID WITH beta-HYDROXYETHYL BENZOATE

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 8-10

SOROKIN, M. F. and CHEBOTAREVA, N. A.

[Abstract] At the present time no unified theory for the mechanism of alcohol esterification with dicarboxylic acids exists. While it is probably a catalytic bimolecular process in most cases, the structure of the initial reagents is also known to affect the process and may alter its mechanism. In the present work the kinetics of polyesterification of beta-hydroxyethyl benzoate with pelargonic acid at 170°-200°C in nitrogen and in polar and nonpolar solvents was studied. The reaction is first order with 54.47 kJoules/mole activation energy. Experiments show that the reaction may be either catalytic or non-catalytic, depending on the structure of the initial reagents, the second molecule of the acid reagent acting as catalyst. Figures 1; references 10: 8 Russian, 2 Western.

[302-12765]

SYNTHESIS AND PROPERTIES OF CARBOXYL-CONTAINING ACRYLIC COPOLYMERS

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 10-12

KLYUZHIN, Ye. S., KULIKOVA, A. Ye., LISOVTSSEV, V. V., VALESHNYAYA, T. A., KURILOVA, V. A. and POTAPOV, V. N.

[Abstract] A study was made of the effects of synthesis conditions on the rheological properties of methylmethacrylate-alkylacrylate copolymer melts. Methyl, ethyl, butyl and methylmethacrylates were used. With 10% monomer content in the initial reaction mix, a marked drop in polymerization rate was observed at 70% monomer conversion due to decrease in monomer and initiator content and rise in viscosity which inhibits molecules from approaching close enough to react. Increasing the monomer content in the initial mix results in higher molecular weight and intrinsic viscosity due to the decrease in number of chain transfers in the solvent. If isopropyl alcohol is used as solvent and dodecylmercaptan is present, it is possible to obtain a carboxyl-containing acrylic copolymer of 10,000 molecular weight at high yields. Analysis of the rheological properties of a triple copolymer of acrylic acid with alkylacrylate and alkylmethacrylate shows that it is possible to regulate the viscosity of the resulting melt by altering the properties of the copolymer (molecular weight, composition), and by plastification with acids or fatty alcohols. Figures 2; references 8: 5 Russian, 3 Western.

[302-12765]

SYNTHESIS OF COPOLYMERS OF ETHYLENE WITH ALKYL METHACRYLATES IN CONTINUOUS TYPE AUTOCLAVE REACTOR UNDER HIGH PRESSURE

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 14-17

DUSHECHKIN, A. P., IVANOV, V. I., KHRAPOV, V. S., PANADIY, O. M. and TORNER, R. V.

[Abstract] Ethylene/alkylmethacrylate copolymers, synthesized under high pressure, have many desirable properties and are used in the manufacture of large sized containers, piping and refrigeration equipment as well as additives for petroleum products. In the present work, methyl and ethyl methacrylate copolymers of ethylene were synthesized in a continuous autoclave reactor at 60-140 MPa, 180°-250°C and 260-360 sec. reaction time. Throughout the entire pressure range, the number of alkylmethacrylate links is shown to be higher in the resulting copolymer than in the monomer mixture. Apparently, as pressure is increased, the reaction between ethylene radicals and ethylene accelerates faster than that with alkylmethacrylate. The rate of copolymerization depends on the alkylmethacrylate

content in the monomer mix; as it increases from 0 to 3 mole %. At 6 mole % and above, the reaction rate increases again. The properties of the copolymers depend on the synthesis conditions, i. e., temperature, pressure, initiator, and on the type of alkylmethacrylate. Figures 2; references 9: 5 Russian, 4 Western.
[302-12765]

UDC 678.744.42:541.697

SANITARY-CHEMICAL PROPERTIES OF MEDICAL GRADE PVA-FILMS

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 19-21

BOYKOVA, Z. K., PETROVA, L. I., BOGOMOL'NYY, V. Ya. and KISELEVA, M. N.

[Abstract] Polyvinyl alcohol (PVA) can be used to make perforated film to cover donor wounds resulting from tissue transplantation. In the present work, the sanitary-chemical properties of such films were studied to determine the feasibility of using them in medicine to help heal donor wounds in plastic surgery. PVA films 32-65 microns thick were prepared by extrusion, saponified to about 3% acetate content, heated at 120°-140°C for 30-60 min. to reduce water solubility and perforated. The pH difference between aqueous extracts of the film and a distilled water control did not exceed 0.9. Bromination of the extracts did not exceed 6.4 mg Br₂/liter, except for samples irradiated at 0.1-0.3 MGr. This indicates a low content of compounds capable of bromination. After 24 hours contact with water, the films showed 324-1310 mg O₂/liter. This figure was lowered to 4.5-7.5 after repeated washing, however. No significant differences in sanitary-chemical properties were observed in samples prepared by different means or sterilized by gamma-radiation to 0.035 MGr. The formaldehyde and methanol contents in the extracts were below the minimum allowed for food products. PVA films, therefore, as prepared from polyvinyl acetate either by extrusion or by suspension in solution, have satisfactory sanitary-chemical properties. Industrial production of the films has been mastered. Figures 2; references 9: 8 Russian, 1 Western.
[302-12765]

EFFECT OF UV-RADIATION ON ADHESIVE REACTION IN SYSTEM (PEHP) + CEVA) + PETF

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 25-27

KAYAK, Ya. A., VAYNSHTEYN, A. B. and KAZACHKOVA, O. I.

[Abstract] The effectiveness of double-laminated plastic films such as polyethylene + polyethylene terephthalate (PETF) depends on the durability of the adhesive bond. Addition of ethylene/vinylacetate copolymer (CEVA) increases the adhesion of high pressure polyethylene (PEHP) to PETF. In the present work, a study was made of the effects of ultra-violet radiation on the adhesion of PEHP containing 6-25% vinyl acetate as copolymer to PETF substrate. UV-radiation increases the resistance to delamination as the vinyl acetate content is increased from 6.6 to 25% owing to the increase in oxygen-containing chromophores and the drop in crystallinity. Resistance to delamination is also a function of the preliminary heat treatment. Water-resistance of the films decreased with rising contact temperature with all adhesives. Thus the properties of laminated films may be varied by changing the time and temperature of lamination, the duration of UV-radiation and the composition of the adhesive. Figures 2; references 13 (Russian).

[302-12765]

CROSS-LINKED POLYMERS FROM OLIGOCYANURATES AND OLIGOEPOXIDES

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 27-28

POGOSYAN, G. M., ZAPLISHNYY, V. N., PANKRATOV, V. A., FRENKEL, Ts. M., FAYNLEYB, A. M. and KORSHAK, V. V.

[Abstract] It was previously shown in the reaction of triphenylcyanurate with phenylglycidylate ester that the oxirane ring can react with cyanurate rings to form oxazolidane rings if excess alpha-oxide is present. In the present work a study was made of the reactions taking place during interaction of oligocyanurates with oligoepoxides, and the structure and properties of some of the resulting cross-linked polymers. Five polymers were prepared from various oligocyanurates, diglycidyl ester of bis-phenol A and epoxydiane oligomer grade ED-20. The chemical structures of the cross-linked polymers were determined by IR-spectra. Oligocyanurate compositions with epoxide oligomer ED-20 were tested as adhesives. Optimum shear stress resulted after 7 hours at 180°C. This was characteristic of all of the other compositions making them suitable for use as adhesives. Figures 1; references 5: 3 Russian, 2 Western.

[302-12765]

EFFECT OF UV-RADIATION ON SERVICE PROPERTIES OF POLYCARBONATE

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 28-30

NAYDENOVA, G. P. and PAVLOV, N. N.

[Abstract] Since bis-phenol-A-based polycarbonate may be used for structural and optical materials, a study was made of the changes in mechanical properties of this polymer after UV-radiation. Samples of varying thickness were prepared by casting methylene chloride solutions of polycarbonate of various concentrations of plate glass. Weather-resistance tests at $65 \pm 5^\circ\text{C}$ in an artificial weather device (GOST 17171-72) showed that a 3-fold increase in temperature has no significant effect on the strength of the film. Irradiation with both a mercury-quartz lamp and a xenon-arc source showed that change in mechanical properties varied with the light source, i.e., the UV-spectrum range. The kinetics of by-product accumulation was essentially the same for both light sources. Figures 1.

[302-12765]

USE OF POLYMETHACRYLATES AS ADHESIVES

Moscow PLASTICHESKIYE MASSY in Russian No 5, May 85 pp 33-34

RYSKINA, Yu. P., MAMEDOVA, E. S. and MEKHTIYEV, S. I.

[Abstract] Adhesion test results are presented on three polymethacrylates synthesized from methacrylic acid and $\text{C}_8\text{-C}_{12}$ alpha-olefins, specifically polyoctyl, polydecyl and polydodecyl methacrylates. The polymers had high thermal resistance and low density. Adhesion was tested on polyethylene-to-polyethylene (film), during alumin-to-duralumin, duralumin-to-polyethylene film, wood-to-wood (sheet), polyethylene-to-fabric, fabric-to-fabric, polyethylene sheet-to-polyethylene film and copper foil-to-copper foil. The samples were joined by glueing with 50% solutions of the polymers and by fusing. The latter formed a much stronger joint. Tests showed that linear polymethacrylates have low adhesion strength to polyethylene film and sheet, and to copper foil. Polymethacrylates based on alpha-olefins have satisfactory adhesion to a variety of substrates and also have high thermal resistance. References 7: 6 Russian, 1 Western.

[302-12765]

EFFECTS OF STRETCHING ON HIGH-TEMPERATURE RADIOTHERMOLUMINESCENCE OF POLYETHYLENE

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85
(manuscript received 10 Oct 83) pp 1166-1170

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Physicochemical Institute imeni L. Ya. Karpov

[Abstract] A study was conducted on radiothermoluminescence plots of high-density polyethylene with MW ranging from 3.5×10^4 to 10^6 in air under temperatures of 100 to 360°K, following 5 kGy gamma-irradiation (Co-60) at 273°K. The intensity of luminescence increased exponentially with the degree of stretching (32 mm/min; 20 x 5 x 2 mm samples) when the multiplicity of elongation exceeded a factor 10. Annealing and rapid cooling of the stretched samples in water at room temperature led to diminished radiothermoluminescence at 330-340°K, temperatures at which the intensity of the secondary relaxational events and of the elasticity modulus decreased. These observations indicated that luminescence above room temperature and the modulus of elasticity are predicated on the structure of the amorphous regions in polyethylene, since crystallites retain stability to 38-385°K. Increase in the intensity of radiothermoluminescence is assumed to be related to the proportion of maximally elongated or stretched regions of the molecule in the transconformation connecting neighboring crystallites. Such amorphous regions serve as bridges that facilitate charge or energy of excitation transfer among the different regions of the molecule. Figures 3; references 20: 9 Russian, 11 Western.
[312-12172]

UDC 541.64:542.943

CHANGES IN MW DISTRIBUTION OF HIGH DENSITY POLYETHYLENE FOLLOWING OZONE/OXYGEN OXIDATION AT MECHANICAL STRESS SITES

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85
(manuscript received 10 Oct 83) pp 1171-1178

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of Chemical Physics, USSR Academy of Sciences

[Abstract] Studies were conducted on the effects of oxidation by ozone/oxygen mixture on the MW distribution of high density polyethylene, following exposure for 1 or 5 h at 15°C in conjunction with 7.5-fold stretching. The oxidizing mixture contained 0.7 or 1.5 moles of ozone per cubic meter of mixture. Analysis of the MW distribution patterns demonstrated that a combination of oxidation and stretching leads to concurrent destructive and cross-linking processes, with the ratio of the two processes dependent on the degree of stretching. With longer duration of oxidation, destruction

commences immediately with the application of the mechanical force, leading to an immediate increase in the low MW fraction of polyethylene. Mathematical and chemical analysis of the putative factors involved in this interplay of factors leading to changes in the MW distribution indicated that stretching enhanced those chemical reactions which involve rehybridization of the carbon atom from sp^3 to the sp^2 state. Tabular data are presented on cross-linkage disruption in relation to $[O_3]$ by polyethylene. Figures 4; references 22: 19 Russian, 3 Western.
[312-12172]

UDC 541(64+126):536.46

EXPERIMENTAL DETERMINATION OF POLYMER FLAMMABILITY ON EXPOSURE TO LOW-CALORIE SOURCES

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85 (manuscript received 12 Oct 83) pp 1185-1189

FILIPPOV, A. A., KHALTURINSKIY, N. A. and BERLIN, Al. Al., Institute of Chemical Physics, USSR Academy of Sciences

[Abstract] Flammability of several different polymers (polyformaldehyde, polystyrene, polymethacrylate, polyethylene, polyamide, polycarbonate, polyvinyl chloride) was tested in electrically heated cylinders simulating low-calorie conditions. The data revealed that for a given polymer a minimal cylinder temperature (T_3) can be identified which will lead to combustion. This parameter (T_3) was found to be inversely related to air temperature in the cylinder and the diameter of the cylinder. T_3 was, therefore, interpreted to reflect the flammability of the mixture of products of polymer destruction and air, and, in conjunction with the induction time, can be used to assess polymer flammability vis-a-vis low-calorie sources. In addition, polymer film thickness need have a critical thickness (h_{cr}) to provide an adequate concentration of destruction products for combustion to occur. For the polymers in question, h_{cr} has been established at ca. 3×10^{-3} cm. Figures 4; references 15: 9 Russian, 6 Western.
[312-12172]

ANALYSIS OF OLIGOCARBONATE METHACRYLATE POLYMERS SYNTHESIZED BY THREE-DIMENSIONAL COMPRESSION

Moscow VYSOKOMOLEKULARNYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85
(manuscript received 13 Oct 83) pp 1197-1202

GRACHEV, A. V., KISELEV, M. R. and SIVERGIN, Yu. M., Institute of Chemical Physics, USSR Academy of Sciences

[Abstract] Physical chemical studies were conducted on bis-(methacryloyloxyethyleneoxycarbonyloxyethylene) oxide synthesized by standard methods and under hyperbaric (512 MPa) conditions in silicon oil with three-dimensional compression. Significant differences were noted in the samples prepared by conventional methods under atmospheric pressure and the samples obtained by three-dimensional compression. The latter samples were characterized by higher density and elastic modulus, and lower temperatures of glassy transition and deformability. Electron micrographs of polymer surfaces prepared by the two different methods reflected the higher density characteristics of the samples prepared by the compression approach. Figures 4; references 4: 3 Russian, 1 Western.
[312-12172]

POLYMERIZATION AND COPOLYMERIZATION OF DIENES ON LANTHANIDE CATALYSTS

Moscow VYSOKOMOLEKULARNYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85
(manuscript received 13 Oct 83) pp 1203-1207

MARINA, N. G., DUVAKINA, N. V., MONAKOV, Yu. B., DZHEMILEV, U. M. and RAFIKOV, S. R., Institute of Chemistry, Bashkir Branch, USSR Academy of Sciences

[Abstract] An analysis was conducted on the types of bonds formed in conducting polymerization of 2-cyclopropyl butadiene (I), trans-5-methylheptatriene-1,3,6 (II), and trans-trans-octatriene-1,3,6, as well as in copolymerization of butadiene with I or II on a cis-regulating neodymium catalytic system ($\text{NdCl}_3 \cdot 3(\text{tributyl phosphate}) - \text{Al}(\text{iso-C}_4\text{H}_9)_3$). Polymerization of I resulted in a product in which the 1,4-structure predominated. Polymerization of the trienes involved conjugation of double bonds at positions 1 and 3, yielding a chain consisting of 1,2- and 1,4-units, with most of the units in the primary chain existing in the cis-conformation. The copolymers contained a random distribution of the double bonds, with the addition and configuration of the double bonds resembling the pattern seen for the homopolymers. Figures 3; references 8: 3 Russian, 5 Western.
[312-12172]

SYNTHESIS AND CHARACTERISTICS OF FILLED POLYVINYL CHLORIDE

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85
(manuscript received 30 Oct 83) pp 1262-1268

KURTA, S. A., CHUYKO, A. A., KHABER, N. V. and NOVOKSHONOVA, L. A.,
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[Abstract] Studies were conducted on the polymerization of vinyl chloride in the presence of different concentrations of methyl vinyl-Aerosil, to determine the effects of the filler on the course of the reaction. Analysis of emulsion polymerization kinetics at 54-68°C showed that 5-15% methyl vinyl-Aerosil increased the rate of polymerization, whereas a further increase in the concentration (20-60%) actually retarded the rate of polymerization somewhat. The order of the reaction in monomer decreased from 0.4 with 5% methyl vinyl-Aerosil to 0.1 with 30% methyl vinyl-Aerosil, while the energy of activation increased from 85 to 102 kJ/mole. Determinations of volume and density parameters indicated that in the emulsion approach Aerosil particles were distributed within polyvinyl chloride globules, with the polymer transformed into an adsorbent layer. Figures 8; references 10 (Russian).
[312-12172]

MECHANISM OF LIGHT-PROTECTIVE EFFECT OF CARBON BLACK IN PHOTOOXIDATION OF SECONDARY POLYETHYLENE

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85
(manuscript received 9 Nov 83) pp 1313-1317

MARGOLIN, A. L., VELICHKO, V. A., SOROKINA, A. V., POSTNIKOV, L. M.,
LEVIN, V. S., ZABARA, M. Ya. and SHLYAPINTOKH, V. Ya., Institute of
Chemical Physics, USSR Academy of Sciences

[Abstract] An evaluation was made of the protective effects and mechanism of action of carbon black on secondary polyethylene subjected to photo-oxidation. The assessment of the effects of different concentration of carbon black (0.5-3.0 wt%) was conducted under conditions in which the polymer samples were illuminated with 260-400 nm light ($\approx 3 \times 10^{16}$ photons/cm² x sec) under oxygen at 30°C. Comparison of oxygen uptake data and stretch destruction showed that maximum protection was afforded by 3% carbon black concentration. The basic mechanism of the protective effects of carbon black were due to a decrease in the rate of oxidation by more than an order of magnitude. In low concentration carbon black acts as a UV-shield, while at higher concentrations an inhibitory effect comes into play due to

various functional groups on carbon black, such as phenol radicals.
Figures 2; references 10: 7 Russian, 3 Western.
[312-12172]

UDC 542.952.6

PHOTOPOLYMERIZATION OF VINYL MONOMERS USING QUINOLINE-BROMINE CHARGE-
TRANSPORT COMPLEX AS AN INITIATOR

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 4 Jul 84) pp 32-35

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[Abstract] The complex was prepared by carefully mixing chilled solutions of quinoline and of bromine in carbon tetrachloride and filtering off the resultant compound in the dark. Polymerization of purified acrylonitrile, ethylmethacrylate, styrene, and dimethylitaconate was carried out in sealed glass ampules with 100 mg of the initiator in a 0.05 g-mole ratio with the monomer. Once the ampules were placed in daylight, polymerization rapidly began and continued for 4-5 h, forming transparent glassy polymers (except acrylonitrile). However, polymerization of acrylonitrile and dimethylitaconate required either a longer induction period or a doubled concentration of initiator. Samples were then washed before determining their viscosity and curve of thermooxidative destruction. Infrared spectroscopy confirmed the presence of the polymers. A free-radical mechanism for their formation is proposed which accounts for the observed presence of a terminal bromine in the polymeric chains. Figures 1; references 5: 4 Russian, 1 Western.
[310-12672]

UDC 678 74322/088.8/

INFLUENCE OF EPOXIDED COTTON SOAP STOCKS ON THERMODESTRUCTION OF NONPLASTICIZED
POLYVINYLCHLORIDE

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 10 Oct 84) pp 39-42

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[Abstract] Cotton soapstocks [sic], formed during neutralization of extracted oils, contain 40-60% fats, gossypol and its derivatives, metallic residues, excess alkali and water--a heterogeneous mass melting at 50-55°C. With the addition of epoxide groups, these stocks can thermally stabilize

polyvinylchloride. Using a formic acid method, samples containing 26-27% oleic and 23-24% linoleic acids had epoxide groups added at unidentified double-bond positions. Their stabilization effect was compared to commercial epoxidized sunflower and soy oils. The epoxidized soapstocks did not provide as long an induction period (time to evolution of HCl at 175°C) as epoxidized soy oil, but did provide a longer induction time than epoxidized sunflower oil and gave better color stability than either of the commercial oils. The addition of Na and Cd salts of organic acids provided a synergistic effect. Dehydrochlorination proceeded linearly; the epoxidized soapstocks reduced the rate of this reaction by 1.4-1.9 times compared to the commercial epoxidized oils. Figures 2; references 9: 8 Russian, 1 Western. [310-12672]

UDC 530.14:541.64:615.779.3:547.39

SYNTHESIS AND POLYMERIZATION OF N,N'-ANABASINOMETHYLENEACRYLAMIDE

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 10 cec 84) pp 42-45

SIKDAR MD-ALI BORKHAN, BABAYEV, T. M. and MUSAYEV, U. N., Tashkent Order of Labor Red Banner State University imeni V. I. Lenin

[Abstract] The monomer was synthesized by reacting acrylamide and formaldehyde in water solution with anabasine. Polymerization was carried out in a water solution with a potassium persulfate initiator. Kinetics were studied with the concentration of the monomer varying from 0.21 to 0.55 mol/l and the initiator from 1.8 to 7.5×10^{-3} mol/l. The reaction rate, calculated on the basis of polymerization vs. the concentration of the monomer, was second order, apparently due to intramolecular hydrogen bonding. Temperature dependence of the reaction in the range 45-80°C showed the initial speed of polymerization increasing with temperature and indicated an energy of activation of 17.5 kcal/mol. The polymer itself was a white powder easily soluble in water. Studies with white mice showed its toxicity to be 50 times less than anabasine itself, indicating a potential pharmacological use. Figures 4; references 6: 5 Russian, 1 Western. [310-12672]

FUNCTIONAL ANALYSIS OF COPOLYMERS OF VINYLACTAMS WITH ALDEHYDE GROUPS

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 13 Nov 84) pp 56-58

MIRZAYEV, U. M., INOYATOV, M. D. and ABDULLAYEV, O. G., Institute of the Chemistry and Physics of Polymers, UzSSR Academy of Sciences

[Abstract] Qualitative determination of aldehyde groups can be made by treating a water solution with hydroxylamine hydrosulfate and titrating the released sulfuric acid. The same method can be used with copolymers insoluble in water (such as vinylcaprolactam with >5% crotonaldehyde) by using water-alcohol mixes and titrating with bromophenol blue or potentiometrically, although the chlorimetric determinations may require comparative titrations of control solutions. Various alcohols at different concentrations can be used--for the indicated copolymer, an optimal solution of 15:85 water:ethanol was determined. Higher alcohols, such as propanol, require a significantly lower concentration. References 5: 3 Russian, 2 Western.
[310-12672]

BASIC PRINCIPLES OF PROCESS OF HYPOCHLORITE CLEANING WITH CAPROLACTAMS

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 11 Feb 85) pp 70-74

KOKOULINA, M. F., NENASHEVA, T. N., PANCHEVA, T. V., TIKHONOVICH, V. Yu., YUSUPOV, P. P. and KATSOBASHVILI, V. Ya., Chirchik Production Association "Elektrokhimprom"; State Institute of the Nitrogen Industry

[Abstract] During caprolactam production, treatment of cyclohexane carboxylic acid by nitrosylsulfuric acid gives an assortment of amide by-products. As the caprolactam is extracted by toluol, these amides are normally removed by conversion into amines with an alkali solution of sodium hypochlorite and subsequent distillation. This reaction requires over 1.5 h and a significant excess of hypochlorite. Consequently, reaction kinetics of hypochlorite with hexahydrobenzamide were studied at 25°C. For both homogeneous and heterogeneous systems, carrying the reaction to completion required a 3-6 times excess of hypochlorite, apparently because of side reactions. In the heterogeneous system, reaction speed was also dependent on diffusion between water and toluol phases. The presence of caprolactam speeded the reaction by forming N-chlorocaprolactam which also reacted with the hexahydrobenzamide to ultimately increase the production of cyclohexylamine. Figures 4; references 9 (Russian).
[310-12672]

THERMOSTABILITY OF POLYVINYLCHLORIDE AND POLYVINYLIDENEFLUORIDE PREPARED IN PRESENCE OF CERTAIN METAL OXIDES

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 14 Sep 84) pp 76-79

LATYPOV, T. L., NAZHIMOV, K. O. and MASHARIPOV, S., Tashkent Order of Labor Red Banner State Medical Institute

[Abstract] Vinylidene fluoride and vinyl chloride were polymerized at 40°C in the presence of oxides of Ti, Zn or Al (20% by weight of monomer). For both monomers, the Al oxide slightly slowed the polymerization rate, while the other two oxides slightly increased it. However, all three oxides significantly improved stability of polyvinylidene fluoride at 450°C, with Zn oxide having the largest effect, apparently due to a capability to bind hydrogen fluoride. A similar effect was not observed with vinyl chloride at 170°C--evidently active centers do not form on the metal oxide surfaces at this lower temperature. Figures 2; references 4: 2 Russian, 2 Western. [310-12672]

PRODUCTION AND INVESTIGATION OF FIRM POLYURETHANE FOAMS BASED ON HYDROXYL-NITROGEN-CONTAINING OLIGOMERS

Moscow UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 3, May-Jun 85
(manuscript received 4 Oct 84) pp 79-81

TASANBAYEVA, N. Ye., MAGRUPOV, F. A. and ABDURASHIDOV, T. R., Tashkent Order of Friendship of Peoples Polytechnic Institute imeni Abu Raykhan Beruni

[Abstract] Because of their high cost and viscosity and their low activity, catalysts usually used in polyurethane foam production are unsatisfactory. Two substitutes investigated were oligomers of ethylideneaminoethanol and benzylideneaminoethanol. Both produced better foaming action than the standard commercial catalyst. Measurements of physico-mechanical properties of the produced foams indicated both oligomer catalysts had optimal concentrations well below the commercial catalyst, yet yielded foams with better mechanical properties. Figures 1; references 7: 2 Russian, 5 Western. [310-12672]

THERMAL STABILITY OF POLYCAPROAMIDE MODIFIED BY PETROLEUM PITCH

Tallinn IZVESTIYA AKADEMII NAUK ESTONSKOY SSR: KHIMIYA in Russian, No 2, Apr-May-Jun 85 (manuscript received 10 Dec 84) pp 150-153

DZHASHIASHVILI, T., KRYAZHEV, Yu., KIRRET, O. and KOGERMAN, Ayli, Moscow Textile Institute; Institute of Chemistry, Estonian SSR Academy of Sciences.

[Abstract] A study is made of the possibility of increasing the thermal stability of polycaproamide (PCA) fiber by introduction of small quantities of petroleum pitch, up to 10% of fiber mass. Three pitch specimens prepared from still residue asphalt from Western Siberian petroleum were used to produce the fibers. The specimens were obtained by long-term heating of asphalt in an inert atmosphere with gradually rising temperature. It was found that increasing the final temperature of pitch processing increased the melting point of the toluene-insoluble fraction, while the flow index decreased. Polycaproamide-containing pitch was found to be resistant to thermal oxidative destruction at temperatures of over 300°C. Figures 2; references 4: 2 Russian, 2 Western.
[301-6508]

UDC 546.791+546.19

NOVEL URANIUM COMPOUNDS: MONOSUBSTITUTED URANIUM (IV) ARSENATE

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 28 Jan 84; in final form 20 Jun 84) pp 254-257

CHERNORUKOV, N. G., VOINOVA, L. I. and KORSHUNOV, I. A.

[Abstract] Monosubstituted uranium (IV) arsenate $(U(H_2AsO_4)_4 \cdot 8H_2O)$ was prepared by mixing equal volumes of 1 M UCl_4 , 5 M H_2AsO_4 and 1 M HCl , and subjected to IR and x-ray analyses. The resultant product consisted of bright-green crystals that readily underwent hydrolysis in water. IR and x-ray analyses revealed a typical orthoarsenate structure. On heating at 38 and 63°C the compound lost two and three, respectively, moles of water without changes in the crystalline lattice. At 88°C an additional mole of water was lost with the formation of $U(H_2AsO_4)_4 \cdot 2H_2O$ and change in the crystalline state. Complete loss of water at 110°C led to full loss of the crystalline state with subsequent condensation of the acid arsenate groups over a temperature range of 110-350°C. The amorphous condensation product was determined to have the formula $UO_2 \cdot 2As_2O_5$ and retained stability to 710°C. Above 710°C it underwent decomposition to U_3O_8 , As_2O_3 and O_2 . Figures 2; references 9: 1 Polish, 8 Russian.
[328-12172]

UDC 541.15+541.183+546.96

COPRECIPITATION OF LOW RUTHENIUM CONCENTRATIONS WITH CERTAIN METAL HYDROXIDES

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 31 May 83) pp 257-262

KOCHETKOV, V. L., PLOTNIKOV, V. I. and TURBAYEVA, T. I.

[Abstract] Radioactive tracer methodology was employed in following the efficiency of various metal hydroxides in coprecipitating low quantities of ruthenium. In terms of efficiency of extracting Ru from nitrate solution, the metal hydroxides ranked as follows: $Ti > Fe > Zr > Y > Gd > Eu > Al$. Coprecipitation with these trapping agents commenced at pH-1, with maximal

coprecipitation obtained at pH 3 with Y and Zr, at pH 5 with Gd and Eu, at pH 6-8 with Fe hydroxide, and at pH 7-9 with Al hydroxide. In terms of diminishing coprecipitation, selected anionic groups ranked as follows: $\text{NO}_3^- < \text{SO}_4^{2-} < \text{Cl}^-$. The hydroxides were thus shown to be effective in the coprecipitation of low concentration (0.25 M) Ru solutions in nitrate by an acid-base mechanism. Figures 5; references 20: 19 Russian, 1 Western. [328-12172]

UDC 621.039.534

ADSORPTION OF MANGANESE AND COBALT RADIONUCLIDES FROM SODIUM MELT

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 2 Oct 83; in final form 21 May 84) pp 266-269

LASTOV, A. I., KONOVALOV, E. Ye., PETRUKHINA, G. N. and TSYKUNOV, I. V.

[Abstract] Adsorption studies were conducted on the removal of Mn-54 and Co-60 formed in the course of the functional reactor as a result of activation of elements in the steel container walls, following their release from the reactor walls and tubing as a result of corrosion and erosion. Results of controlled ampule studies conducted at 200-450°C showed uptake of the Mn and Co radionuclides from sodium melts by Ni, Fe, Fe-Mg (11.6%) alloy, and Kh18N10T steel. Activated chemisorption was indicated by the direct correlation between the degree of adsorption and the temperature. Ni was somewhat more effective as an adsorbent than the other agents tested. Figures 3; references 9: 2 Russian, 7 Western. [328-12172]

UDC 547.29:546.11.3

PREPARATION OF TRITIATED EICOSATRIENOIC ACID BY HETEROGENOUS CATALYTIC HYDROGENATION OF ACETYLENE PRECURSOR

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 10 Oct 83; in final form 22 Mar 84) pp 301-304

DUKAT, L. P., FEDOSEYEV, V. M., MYASOYEDOV, N. F., SHEVCHENKO, V. P., LAZURKINA, T. Yu. and MYAGKOVA, G. I.

[Abstract] Experimental studies were conducted to determine optimal conditions for preparation of tritiated eicosatrienoic acid, using as test compounds allyl and propargyl alcohols in heterogenous catalytic hydrogenation with gaseous tritium, as well as propargyl-allyl alcohol mixtures. Optimal conditions for hydrogenation of the triple bond were found to involve a 5% Pd/BaSO₄ catalyst, dioxane with quinoline, a temperature of 23°C,

and a P_{H_2} of 200 GPa. The methyl ester of eicosatrienoic acid was selected for hydrogenation as a more stable compound. While the specific radioactivity of allyl and propargyl alcohols ranged from 111 to 936 GBq/mmol, that of tritiated eicosatrienoic acid ranged from 52 to 430 GBq/mmol for 3 and 80% 3H_2 . Testing the latter for biological viability in a prostaglandin synthase system resulted in the synthesis of prostaglandin E_1 with corresponding specific radioactivities. References 7: 4 Russian, 3 Western. [328-12172]

UDC 541.15

RADIOCHEMICAL ASPECTS OF AGING ORGANIC SOLUTIONS OF PLUTONIUM

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 25 May 83) pp 336-342

RENARD, E. V., FEDOSEYEV, D. A., MILOVANOV, A. S., LUNUCHKINA, K. P.,
BOYKOVA, I. A., NEUMOEYEV, N. V. and VLADIMIROVA, M. V.

[Abstract] In view of the importance of extractive processes for regeneration of breeder fuel at fast neutron reactors of nuclear power stations, an analysis was conducted on the radiochemical behavior of plutonium in aging organic solvents. The study involved determination of bound plutonium (unextracted by nitric acid) and spectrophotometric determination of plutonium-DBP complexes, as well as the effects of uranium on TBP hydrolysis. Comparison of data obtained at 22 and 61°C demonstrated that, at 61°C, higher rates of bound plutonium accumulation prevailed in the form of Pu(IV)-DBP complexes in the Pu(IV) + 30% TBP + n-dodecane system. The degree of bound plutonium accumulation could not be accounted for by TBP hydrolysis and radiolysis to DBP. The rate of formation of bound plutonium was significantly depressed (ca. 4.5-fold) by the presence of uranium (ca. 0.3 moles/L) due to the formation of U(VI)-DBP complexes. Figures 5; references 6 (Russian). [328-12172]

VOLATILE ACTINIDE BETA-DIKETONATES AND THEIR POTENTIAL APPLICATIONS

Leningrad RADIOKHIMIYA in Russian Vol 27, No 3, May-Jun 85
(manuscript received 25 May 83) pp 354-361

MISHIN, V. Ya., SOLOV'YEV, S. M., CHINENOV, P. P., VORONIN, A. S.,
KAPITONOV, V. I., RUBTSOV, Ye. M., SOLOSHENKOV, P. S., ISUPOV, V. K. and
PROKOPCHUK, Yu. Z.

[Abstract] Description is provided of the synthesis of a series of actinide beta-diketonates as potentially-useful agents that are stable at room temperature and retain stability at higher temperature until the m.p. is reached in a protective atmosphere. Synthesis of Th, U, Np, Zr, Pu, Hf, Ce, Nd, Gd, Cu and Yb dipivaloyl methanates involved initial slow neutralization of water-alcohol solutions containing the inorganic salt and dipivaloyl methanate with water-alcohol base solutions. The resultant metal dipivaloyl methanates were dried and purified by vacuum sublimation or recrystallization from an organic solvent. In the case of Zr^{4+} , Hf^{4+} , Th^{4+} and Pu^{4+} , the authors obtained $M(thd)_3X$ -type of complexes, with $X = NO_3^-$ or ClO_4^- , in addition to $M(thd)_4$ complexes. Determinations were made of temperatures of polymorphic transformation (160-227°C) and of melting points (205-374°C). Thermodynamic parameters of volatilization yielded $\Delta H/\Delta T$ values of ca. 34 to ca. 101 kJ/moles, $\Delta S/\Delta T$ values of ca. 22 to ca. 155 J(mole·K). Such novel compounds may find utility in the transformation of various reagents into the vapor phase, specifically in such processes as sublimation separation of metals, gas chromatography, isotope separation etc. Figures 3; references 16: 10 Russian, 6 Western.
[328-12172]

UDC 541.64:547.538.141

EFFECTS OF PROPERTIES OF INITIAL EMULSION ON EMULSION POLYMERIZATION OF STYRENE

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 27, No 6, Jun 85 (manuscript received 28 Oct 83) pp 1249-1253

ZHACHENKOV, S. V., LITVINENKO, G. I., KAMINSKIY, V. A., IL'MENEV, P. Ye., PAVLOV, A. V., GUR'YANOVA, V. V., GRITSKOVA, I. A. and PRAVEDNIKOV, A. N., Scientific Research Physicochemical Institute imeni M. V. Lomonosov; Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov

[Abstract] The effects of the nature of the starting emulsion on the characteristics of the polymeric products obtained by emulsion polymerization of styrene were investigated at 50°C, using different proportions of water, styrene and emulsifying agent. With a water:monomer:emulsifying agent system of 1:1:1 the mean molecular weight of the products was 1.2×10^3 . The MW value rose to 4×10^5 if the previous system was additionally diluted with water to a monomer:water ratio of 1:50 with 1.75 wt% emulsifying agent. With further addition of the monomer to the dilute system to yield a monomer:water ratio of 1:2, the MW spread ranged from 8×10^5 to 3×10^6 , depending on the degree of conversion. Evaluation of MW distribution in the latter case showed a bimodal pattern, with the low-MW peak much less pronounced than the high-MW peak. Thus, the nature of the initial emulsion, while having no profound effect on the rate of polymerization of styrene, significantly affected the MW of the polymer. Figures 6; references 5: 4 Russian, 1 Western.
[312-12172]

PURIFICATION OF GALVANIC PROCESS WASTE WATER

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 5, May 85, pp 6-8

NAYDENKO, V. V., doctor of technical sciences, GUBANOV, L. N., candidate of technical sciences, KNOKHINOV, B. I., engineer, and BEDNOVA, L. I., candidate of chemical sciences, Gor'kiy Construction Engineering Institute.

[Abstract] Various systems have been developed both in the Soviet Union and abroad for purification of the wastewater from galvanic coating shops, including closed recirculation systems. Flexible automated purification processes with modular implementation of technology is required for today's level of production. A second task is the creation of waste-free galvanic production processes by a combination of ultrafiltration, iron exchange, reverse osmosis and adjustment of eluates and concentrates with acids, alkalis and oxidizers. The problems laboratory of the Gor'kiy Construction Engineering Institute has analyzed the operation of a number of domestic plants and determined that these structures do not provide the required effectiveness of purification due to errors in initial data used for planning, information on consumption and clearance of reagents. The use of iron exchange purification of wastewater with closed water supply systems is recommended where concentrations of heavy metal ions are not over 6 mg-eq/l and concentrations of organic matter are not over 5 mg/l. It is recommended that the technological process of purification be subdivided into three stages: mechanical and physical-chemical purification in sand or anthracite filters and adsorption filters with granulated activated carbon; softening of wastewaters on sodium-cation filters; and purification on anionite filters or electric dialysis apparatus. References 2 (Russian). [295-6508]

DEGASING HYDROGEN SULFIDE FROM WASTEWATERS

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 5, May 85, pp 8-9

GUBAYDULLIN, M. M., candidate of technical sciences, CHUDINOVA, N. A., GUDTSOV, I. E. and NOVIKOV, V. I., engineers, All-Union Scientific Research Institute of Hydrocarbon Raw Materials, Kazan.

[Abstract] A technological plan has been developed for extraction of hydrogen sulfide from wastewaters such as those of the Novobavlinkskaya Chemical Plant, containing up to 175 mg/l hydrogen sulfide, by thermal and vacuum degasing. The water, at 40°C, is mixed with steam in the intake pipe and fed into a gas separator at 0.2-0.3 MPa. The water vapor acts as a heating and desorption agent, gas separator two is maintained at a pressure of 0.08 MPa to enhance separation. The experiments showed that the conditions selected were the optimal maximum separation. Figures 3.

[295-6508]

UDC: 628.35.004.8

UTILIZATION OF SEDIMENT FROM BIOLOGICAL PURIFICATION OF WASTEWATER

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 5, May 85, pp 10-11

OGURTSOV, A. V., candidate of technical sciences, BOBROVA, V. N. and SAFRONOVA, A. L., engineers, Kalinin Polytechnical Institute; BOBROV, V. V. and TITOV, B. I., Engineers, 'Vodokanal' Production Administration, Kalinin.

[Abstract] Results are presented from studies of a method of utilization of the sediment from wastewater in the production of high quality granulated sorbent from peat and stabilized sediment from biological purification structures in various mass ratios. The stabilized sediment after biological purification of wastewater is a plastic substance. When introduced to peat it acts as binder material, increasing the mechanical strength of the sorbent, and is an active component, replacing from 35 to 75% of the peat. A shop for production of active carbon from peat and sediment can be planned and constructed to be collated with a city aeration plant. A shop producing some 5,000 tons of active carbon per year requires about 250,000 tons of sediment, moisture content 90%, and about 40,000 tons of milled peat, moisture content 60%, with a ratio of peat to sediment of 1:2 as dry mass. The sorbent produced can be used at the same purification plant for further purification of wastewaters. The approximate cost of active carbon would be about 100 rubles per ton at such a plant. References 3 (Russian).

[295-6508]

MEMBRANE FILTER APPARATUS

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 5, May 85, pp 12-13

PETRANOVSKAYA, M. R., RUSANOVA, N. A., candidates of medical sciences; BASIN, D. L., candidate of technical sciences; GOL'DINA, S. D., CHERTILINA, N. Ya. and GALKINA, R. V., engineers, Scientific Research Institute of Communal Water Supply and Purification, Academy of Communal Economics imeni K. D. Pamfilov.

[Abstract] The Scientific Research Institute of Communal Water Supply and Purification of the Academy of Communal Economics, in cooperation with the special design bureau of the academy, has developed a filter apparatus, a set of equipment intended for filtration of water and evaluation of the coli titer of the water. It is also suitable for studies related to determining the content of other bacteria, inorganic substances, etc., in the water. The equipment consists of a filter stage, tank and vacuum pump. The equipment has been tested and accepted for production.
[295-6508]

CULTIVATION OF ALGAE ON YEAST PRODUCTION WASTES

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 5, May 85, pp 22-23

ANDREYEVA, R. A., engineer, SKIRDOV, I. V., doctor of technical sciences and DEMIDOV, O. V., candidate of technical sciences, All-Union Scientific Research Institute of Water Supply, Sewerage, Water Engineering Structures and Engineering Hydrogeology.

[Abstract] A study is presented of the possibility of using the liquid and gaseous wastes from the production of nutrient yeast on petroleum paraffin to cultivate algae biomass while simultaneously purifying the nutrient substrate. Samples of wastewater from the production of nutrient yeast and chlorella algae were used in the study. Cultivation of the biomass and parallel purification of substrates were performed in a laboratory installation at $35 \pm 2^\circ\text{C}$, additional illumination 160 W/m^2 , with a gas mixture containing 1.5-2% CO_2 blown through the liquid continuously. The experiment showed that cultivation of chlorella on wastewater did not cause inhibition of the process of growth of algae cells. On the fourth to sixth day, the concentration of the chlorella culture reached 100-300 million cells per ml, minimum specific cell growth rate being $0.03\text{-}0.08 \text{ hr}^{-1}$, as opposed to $0.04\text{-}0.08 \text{ hr}^{-1}$ in a control medium. Cultivation of the algae was accompanied by effective purification of the initial substrates removing the major biogenous elements, an increase in biological oxidizability of the wastewater

and improvement of the odor of the water. The protein content was lower, the lipid content higher than in the control grown in tap water.
References 4: 1 Russian, 3 Western.
[295-6508]

UDC: 628.349

ELECTROCHEMICAL PURIFICATION OF WASTEWATER

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 5, May 85, pp 29-30

ANDREYEV, A. N. and ANDREYEV, P. P., engineers, Gipronikel', Leningrad.

[Abstract] A study was made of the possibility of purifying solutions of calcium sulfate by electrocoagulation using soluble aluminum anodes. Electrocoagulation was performed on artificially-prepared water containing 1160 mg/l SO_4^{2-} ions. The anodic current density was varied at 0.01-0.10 A/cm², the voltage on the electrodes 5-40 V, treatment time of the water in the coagulator 0.5-10 minutes. Water temperature, pH and content of sulfate ions in the water were measured before and after electrocoagulation. The optimal parameters were found to be as follows: anodic current density 0.02-0.08 A/cm², treatment time 1-5 minutes. No notable passivation of the anode or formation of agglomerates occurred under these conditions, due to timely removal of reaction products from the processing zone and the increased solubility of the aluminum anode at pH = 12. Figures 1; references 5: 4 Russian, 1 Western.
[295-6508]

UDC: 630*86:504.4.06

PROSPECTS FOR IMPROVEMENT OF WATER CONSERVATION AT WOOD CHEMISTRY ENTERPRISES

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2, Feb-Mar 85, pp 14

FIRSOV, A. I., laboratory chief, and SHCHERIKOVA, G. A., Senior Scientist, Central Scientific Research Institute of the Wood Chemical Industry.

[Abstract] Fulfilling the directives of the party and government for further improvement of protection of the environment, prevention of pollution of natural bodies of water with unpurified or insufficiently purified wastewaters, the authors' institute performed continuing studies of improvement of water use systems at wood chemistry plants. Water consumption and

wastewater treatment standards have been established. Continued improvement in local and chemical purification of industrial wastewater before it is sent to biological purification structures is required at pyrolysis and colophony-turpentine enterprises. Methods have been developed for purification of runoff water from wood chemistry enterprises. These surface runoff collection systems should be installed at various wood chemical enterprises. Some 30 million rubles capital investment is required to implement the water conservation program in the industry. References 5 (Russian).
[294-6508]

UDC: 630*863.5.002.5:66.047

INCREASING THERMAL EFFICIENCY OF YEAST SPRAYING DRYERS WITH MODERNIZED HEATING UNITS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2, Feb-Mar 85, pp 4-6

GOL'VEK, S. V., group chief, GORDEYEV, Yu. A., deputy chief, engineer, KUKLEV, Yu. I., chief engineer, TERK, A. R. and LEVNER, M. I., design engineers, 'Energobumprom' Production-Technical Association, NAUSEDA, A. Yu., chief Engineer, Klaypeda Plant, PELSIS, D. Ya., shop chief, Slokskiy Paper Plant, SARING, Ye. N., deputy chief engineer, 'Estonbumprom' Production Association.

[Abstract] The heating units and drying systems of yeast spray dryers have been modernized at a number of plants with the assistance of 'Energobumprom' Production-Technical Association. Modernization of the heating units has consisted of replacement of obsolete 'Berim' heating units with new miniaturized heat generators developed by Energobumprom. Their small size and design simplicity allow the units to be started and heated in a few minutes, and allow the temperature of the drying agent to be adjusted from 50 to 500°C and higher. Operation of dryers has been greatly simplified, since adjustment of the load is reduced to simple adjustment of fuel flow. Their service life is practically unlimited and their economic characteristics are superior to the previous units. Figures 2; references 2 (Russian).

[294-6508]

UDC: 630*863.5:676.163.022.082.2

USE OF MEMBRANE PROCESSES FOR BIOCHEMICAL CONVERSION OF SULFITE ALKALIS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2, Feb-Mar 85, pp 6-7

BABUSHKINA, N. Ye., senior scientist, MIRONOVA, K. P., junior scientist and OSTREVNAYA, O. V., senior engineer, Perm' Branch, All-Union Scientific Research Institute of the Cellulose and Paper Industry.

[Abstract] A number of semipermeable membranes with pore diameters from $30 \cdot 10^{-9}$ to $75 \cdot 10^{-9}$ m have been tested at the author's institute for membrane

separation of spent sulfite alkali. The possibility has been tested for using the ultrafiltrate for the preparation of nutrient media for growing of nutrient yeast by both continuous and batch processes. Superior yeasts were produced in both cases. The expected economic effect of the use of the membrane process in cultivation of nutrient yeast is 106.5 rubles per ton of product.

[294-6508]

UDC: 630*863.1.004.68

EFFECT OF GAMMA RADIATION ON WOOD POLYSACCHARIDES

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2, Feb-Mar 85, pp 7-9

SKVORTSOV, S. V., KLIMENTOV, A. S. and KRAYEV, L. N., All-Union Scientific Research Institute of Hydrolysis.

[Abstract] A study was made of the influence of gamma radiation on the quality of polysaccharides in wood fiber and monosaccharides in wood and bark hydrolysates. Birch and pine wood and bark samples were used in the study. Preparations of pure cellulose containing practically no lignin were isolated and the content of easily hydrolyzable polysaccharides and monosaccharides in the hydrolysates was determined. Difficultly hydrolyzable polysaccharides were assayed as trimethylsilyl esters by GLC. Empirical equations were produced for determination of the content of cellulose and easily hydrolyzable polysaccharides in the gamma-irradiated wood fiber. The yield of easily hydrolyzable polysaccharides was approximately two thirds of the theoretically possible yield. The content of mannose increased by approximately 50%, galactose by a factor of 2.6, glucose by a factor of about 8 in irradiated wood fiber. References 11 (Russian).

[294-6508]

DECREASING THE CONSUMPTION OF BARIUM CARBONATE IN THE PRODUCTION OF CHARCOAL
CARBONIZING AGENT

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2,
Feb-Mar 85, pp 16-17

ZAV'YALOV, A. N., YEFIMOV, L. M., candidates of technical sciences,
POTAPOVA, N. N., Junior Scientist, Central Scientific Research Institute
of the Wood Chemical Industry; KOPOSOVA, A. V., laboratory chief, and
MEDVEDEV, Ye. M., shop chief, Syavskiy Wood Chemistry Plant.

[Abstract] The purpose of this work was to study the possibility of decreasing the consumption of barium carbonate while preserving the quality of the carbonizing agent produced at the Syavskiy Wood Chemical Plant. This required determination of the major forms of barium carbonate loss in the individual technological operations. The reason for the elevated consumption of barium carbonate was found to be deviation in the properties of salts provided by 'soda' plant. It is recommended that a barium carbonate suspension be produced from the product supplied by 'soda' plant by mixing for two hours in a propeller mixer with water to a barium carbonate ratio of 0.75 to 1, water temperature 5-25°C. The finely dispersed suspension thus produced is then mixed with starch paste which is heated in another container. The carbonizer is then produced by the usual method. When the product supplied by the Karpov plant is used, mixing time can be reduced to 30 minutes.
[294-6508]

ELECTROPHYSICAL PROPERTIES OF WOOD CHEMICAL PRODUCTS FROM VARIOUS
ENTERPRISES

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2,
Feb-Mar 85, pp 17-18

ZAVODCHIKOVA, V. V., Senior Scientist and PROTASOVA, N. N., senior laboratory assistant, Central Scientific Research Institute of the Wood Chemical Industry.

[Abstract] Experimentally-determined electrophysical properties of crude tall oil produced from hard wood, pine and mixed wood fiber, sawdust and woodworking scraps are presented. Tall oil specimens were studied to determine dielectric permeability and resistivity. An empirical equation is presented for determining the variation of dielectric permeability of tall oil as a function of moisture content allowing calculation of this factor with accuracy sufficient for engineering purposes. References 3 (Russian).
[294-6508]

PRODUCTION OF WOOD FIBER HYDROLYSATES SUITABLE FOR BIOSYNTHESIS OF LYSINE

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 2,
Feb-Mar 85, pp 13-19

STRIZHEVSKAYA, I. S., senior scientist, KONOVALOVA, O. N. and
GORBATOVSKAYA, N. V., engineers, and STEPANOVA, I. N., Junior Scientist,
All-Union Scientific Research Institute of Hydrolysis.

[Abstract] A study is made of the problem of producing wood fiber hydrolysates containing primarily hexose sugar, the best medium for biosynthesis of lysine. The traditional method of percolation hydrolysis in the presence of 0.5% sulfuric acid was used. The hydrolysates were obtained in a 3 cubic meter hydrolysis apparatus. The hydrolysate produced had 95% hexose sugars and is suitable in principle for biosynthesis of lysine. Figures 2; references 2 (Russian).

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